

Library
OHIO NORTHERN UNIVERSITY

Regulations

1. Books may be borrowed for a period of two weeks.
2. At the expiration of two weeks books may be re-let if returned to the librarian in good condition.
3. A rental of two cents a day will be charged on each book held over two weeks.

Class No. ~~371.3~~ Accession No. 25055

5

.15

THE PRACTICE OF TEACHING
IN THE SECONDARY SCHOOL

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS

THE BAKER & TAYLOR COMPANY
NEW YORK

THE CAMBRIDGE UNIVERSITY PRESS
LONDON

THE MARUZEN-KABUSHIKI-KAISHA
TOKYO, OSAKA, KYOTO, FUKUOKA, SENDAI

THE COMMERCIAL PRESS, LIMITED
SHANGHAI

THE PRACTICE OF TEACHING IN THE SECONDARY SCHOOL

By
HENRY C. MORRISON

Professor of Education in the University of Chicago

REVISED EDITION



THE UNIVERSITY OF CHICAGO PRESS
CHICAGO • ILLINOIS

COPYRIGHT 1926 AND 1931 BY THE UNIVERSITY OF CHICAGO
ALL RIGHTS RESERVED. PUBLISHED FEBRUARY 1926. SECOND
EDITION MARCH 1931. THIRD IMPRESSION OCTOBER 1934

COMPOSED AND PRINTED BY THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS, U.S.A.

373.13
n879 p
931

PREFACE

IN UNDERTAKING the preparation of this volume I have been actuated by a conviction, born of many years' devotion to teaching and to the supervision of educational enterprises, that genuinely effective education, whether it be for the service of the individual or the service of society, must be founded upon a coherent theory of the whole field of teaching, capable of being organized into a practicable system; and further that such a system must be one which at least makes possible much more thorough and genuine learning by all than any which we have usually been able to secure. The book is therefore not at all an exhibit of method—although it brings together a great many phases of method which seem to have adequate foundation in fact and in principle—but rather an analysis of teaching procedure in that field of non-specialized education which begins with the end of the primary school and is brought to a close when the youth is ready to enter the university proper.

It is hoped that all teachers who work in the field which has just been named and who conceive teaching itself to be an exacting intellectual enterprise, quite apart from the materials of instruction, will find the book a useful guide in their methods of pedagogical thinking. Nevertheless, the message is addressed first of all to students of the general educative process and especially to the executive and staff officers of schools who realize that teaching is by far the most important activity which they have to administer.

The volume is the product of a study of teaching as it is found in schools and in undergraduate colleges, and of the literature bearing upon the subject, extending over a period of about twenty-five years. The study has been largely experimental: first, in the schools of a New England city; then at different points under differing conditions and in varying fragmentary forms in a

state system of public schools; and finally, much more systematically, for six years in the Laboratory schools of the University of Chicago.

If I were to mention all who have borne helpful and indeed essential parts in a great variety of ways in the carrying out of the whole undertaking, several pages would be required for the mere lists of names. There would be included the teachers who worked with me so long ago in Portsmouth in finding new ways to teach; scores of teachers and supervisory officers in New Hampshire; hundreds of my university students whose alert criticism, significant queries, and contributions in the form of graduate papers have been an important influence in giving the work its final shape; and finally, the Faculties of the Laboratory Schools.

I am under special obligation to the following colleagues:

1. To Mr. Robert Woellner and Dr. Peter Hagboldt, who read critically the manuscript chapters on the "Practical Arts" and "Foreign Languages," respectively.

2. To Mr. Wilbur L. Beauchamp and Miss Edith Shepherd, who submitted some of the more doubtful points to specific experimental verification.

3. To my associates in the administration of the Laboratory Schools, Dr. William C. Reavis and Mr. Harry O. Gillet, without whose loyalty, practical educational insight, and administrative acumen the laboratory stages would have been impossible.

4. To Professor Charles H. Judd, who read all of Part I in manuscript, and whose trenchant criticisms and generous personal advice have been essential in giving direction to the whole enterprise.

5. To President Emeritus Harry Pratt Judson, whose comprehensive grasp of the foundations of American educational institutions not only made the later stages of experimentation possible but was likewise a source of illumination in the development of my theory of institutional organization.

HENRY C. MORRISON

UNIVERSITY OF CHICAGO

February, 1926

PREFACE TO THE SECOND EDITION

THE first edition has been so generously read and used that a wealth of helpful comment, inquiry and criticism has come into my hands. In the present edition I have tried to clear up, as well as I could, obscurities and misapprehensions and in some instances more fully to defend the positions taken in the first edition.

A very considerable amount of new material has accumulated in the space of five years, in the Laboratory Schools and in other schools, and in current scientific publications. This material has been of substantial value in revising the earlier work, so much so that several chapters have been almost wholly rewritten. A section on geography has been added. The chapter which deals with Conduct has been considerably enlarged. Chapter xxix of the first edition, which dealt with ability, performance, adjustment, and behavior as terms in pedagogical administration, has been replaced by one which considers at length the phenomena of individual differences in learning capacity as the basis of pupil administration. The present edition, however, in no sense replaces the first, save as I hope it may prove to be more useful. No good reasons for any fundamental modification in the principles which were originally set forth have been discovered.

Those readers, few in number I hope, who are looking for a plan which can confidently be put in operation and prove to be a solution of the perplexities of the schoolroom will be disappointed. No such plan can be written, for teaching is not an activity which is susceptible of that kind of guidance. The analysis of the teaching process which is here presented is intended to serve as a coherent, intelligible, and reliable basis from which school people may be helped in thinking out pedagogical problems in the immense variety of schoolroom situations in which the latter are found.

HENRY C. MORRISON

Chicago, October, 1930

TABLE OF CONTENTS

PART I. FUNDAMENTALS IN THE TEACHING PROCESS

CHAPTER	PAGE
I. THE SECONDARY SCHOOL	3
II. THE OBJECTIVES OF SYSTEMATIC TEACHING	16
III. LEARNING AND PERFORMANCE	36
IV. THE PRODUCT OF LESSON-LEARNING	52
V. APPRAISAL OF PUPIL PROGRESS	63
VI. OUTLINES OF SYSTEMATIC TEACHING	81

PART II. CONTROL TECHNIQUE

VII. ESTABLISHING THE LEARNING SITUATION	107
VIII. MEASURING GROUP CONTROL	121
IX. SUSTAINED APPLICATION	141

PART III. OPERATIVE TECHNIQUE

X. INTRODUCTION TO OPERATIVE TECHNIQUE	161
XI. COURSES AND UNITS IN PHYSICAL AND SOCIAL SCIENCE	180
XII. COURSES AND UNITS IN HISTORY AND GEOGRAPHY	199
XIII. COURSES AND UNITS IN MATHEMATICS AND GRAMMAR	231
XIV. EXPLORATION AND PRESENTATION	255
XV. ASSIMILATION	281
XVI. ORGANIZATION AND RECITATION	322
XVII. THE APPRECIATION TYPE	339
XVIII. TEACHING IN LITERATURE—FREE READING	359
XIX. THE COURSE AND UNITS IN LITERATURE	375
XX. RIGHT ATTITUDE TOWARD CONDUCT	399
XXI. THE PRACTICAL ARTS IN GENERAL EDUCATION	433

CHAPTER	PAGE
XXII. TEACHING IN PRACTICAL ARTS	448
XXIII. LANGUAGE ARTS	467
XXIV. TEACHING IN FOREIGN LANGUAGE	484
XXV. TEACHING IN WRITTEN EXPRESSION	511
XXVI. PURE-PRACTICE TEACHING	539
PART IV. ADMINISTRATIVE TECHNIQUE	
XXVII. THE INTEGRITY OF THE SCHOOL	579
XXVIII. THE BASIS OF PUPIL ADMINISTRATION	589
XXIX. CONTROL OF PUPIL PROGRESS	609
XXX. THE PROBLEM PUPIL—CASE WORK	636
XXXI. ORGANIZING THE SCHOOL	667
INDEX	683

PART I
FUNDAMENTALS IN THE TEACHING PROCESS

CHAPTER I

THE SECONDARY SCHOOL

AS THE title of this volume meets the eye of the reader, doubtless his first query will be, What is the secondary school? And the query will probably in most cases be self-answered by the commonly associated term "high school." That is not at all the scope which we are led to assign to the secondary school in the treatment of teaching which we propose to set forth.

I

DISCONTINUOUS SCHOOLS.—The differentiation of our educational institutions into elementary, secondary, and higher, as we find it made concrete in buildings, school organization, administration, and the like, arises in part out of a series of historical accidents and in part out of administrative convenience and tradition.

The three schools with which we are familiar have developed, not by differentiation from a common institutional origin for the better service of a common purpose, but from three distinct schools, each of them founded to serve a rather definite purpose and each of them in the beginning substantially unrelated to the others. The eight-grade elementary school, as we know it, is the indigenous common school, modified by the efforts of administrators in the second quarter of the nineteenth century to adapt the Prussian theory of common-school organization and institutional purpose to American needs. The high school, which is the most common form of the American secondary school, comes down to us in direct descent from the academies which flourished in the northeastern states throughout the first three quarters of the nineteenth century. The oldest of our existing institutions is the college which early became essentially a pre-professional

school and in which vocational purposes still to a considerable degree persist.

Now each of the original schools had its own purpose and its own separate existence. The old common school was not ordinarily set to prepare for the academy or later the free high school, nor was it the main business of the early high school or academy to prepare for college. Down until nearly the end of the nineteenth century, comparatively few pupils passed on from the common school to the high school, and cases were rare in which graduates of the free public high school went to college. The surpassing educational awakening which began to be evident at about 1900 changed all that. Ordinary folks in ever-increasing numbers began to plan to send their children to college. The easy-going ways which had answered for a century would no longer serve. The history of educational administration since 1890 is to a large extent a story of endless efforts to make the elementary school, the high school, and the college pull together for a common educational purpose. The record which shows how the action of social, economic, educational, and even pedagogical forces has been stimulating the process of adaptation within each of the fundamental institutions and of mutual adjustment between the three is an interesting and significant tale. The rise of the junior high school, the junior college, the state university, and the graduate school of the university are illustrations.

VERBAL STEREOTYPES THE RESULT.—The persistence of these essentially separate institutions in the performance of an educational task which in its nature is not discontinuous has generated certain stereotypes in the thinking of both administrators and teachers. An elementary school, a high school, and a college were found ready at hand when the early students of school organization undertook their task. As each new generation of school people came on the ground, it found the old distinctions between schools in existence, albeit each decade had seen the growth of working agreements touching division of labor between the several parts of the system. What more natural than to suppose that

there must be something inherent in human nature and the educative process which requires the kind of succession in stages for which the historic institutions had come to stand?

The elementary school came to be an institution to which eight years of school life was assigned as the normal allowance. Similarly, the high school and college each required by tradition four years of the student's life. Hence, the stereotype became firmly established that education is primarily a matter of time to be spent, and further that an 8-4-4 distribution of years between the successive schools is the one which is sanctioned by nature. When, in the course of time, the process of transition from the elementary school to the high school had come to require adjustment, administrators, still faithful to their stereotype, could think of no other solution than the insertion of a new institution expressed in terms of years, and so the junior high school came into existence. The discussions which then took place almost always centered about differences in views as to whether the new system should be a 6-3-3-4 plan or some other combination of years. Similarly, debates touching the organization of colleges, graduate schools, and professional schools have with few exceptions turned upon the question, How many years shall be devoted to this and how many to that? Seldom has the factor of attainment quite independent of time-to-be-spent been brought into the problem. The influence of the stereotype in purely pedagogical administration might be traced at great length, and indeed we shall have occasion to recur frequently to this aspect of the situation.

The discontinuous character of the fundamental institutions of course led to the construction of separate buildings, often resulting in a great waste of money, and these very tangible and concrete evidences of discontinuity have no doubt done much to perpetuate the stereotype. To many it is unthinkable that any study can properly be done within the four walls of a building devoted to elementary-school purposes which tradition has assigned to the high school. To do college work within the high-school building is, in the minds of some people, to make an assault on the very

citadel of culture. Not infrequently, the plea for admission to college of a student who is held to be qualified, irrespective of the time he has spent in school, is met with the verdict, "No, we must stand for a four-year high school founded on an eight-year elementary school." To imply that this particular attitude is still universal and continues unmodified is to be recreant to the facts of recent history. The origin of the attitude itself is nevertheless significant.

Similarly, the stereotype has generated certain fundamental assumptions touching the maturity of the individual and theories of teaching which have little or no basis in principle. The traditional administrative assumption is that a pupil is mature enough for high school when he has satisfactorily completed eight years of pre-high-school study and mature enough for college when he has completed four more years of high school. Education being defined as it is, in terms of years of experience and successive institutional stages, it is extremely difficult to convince the laity that the pupil is not unjustly treated when he is required to spend more than one year in a grade. Theories of teaching are not unnaturally based upon maturity assumptions. Hence it has come to pass that it is often taken for granted that the eight-year elementary school calls for one conception of teaching, the four-year high school for another, and the college for a third. And so books and college courses on teaching are apt to bear such titles as *Methods of Teaching in the High School*, *The Elementary Teacher*, *College Teaching*. In recent years, college authorities have come to be greatly concerned about college teaching. It is easy to see that most pronouncements to date are based on the assumption that there is a peculiar sanctity in the college and that college teaching must of necessity be something quite different from high-school teaching. As if admission to college were a mystic rite capable of working a miracle in the pupil's learning capacity between June and September. The outcome of the whole development of the fundamental institutions, so far as it affects—as it does affect—a valid theory of teaching, brings us into the heart

of our present problem. We must therefore ask the reader to consider the limits of the secondary school, in so far as they affect the theory of the teaching process and the outcome thereof in a system of teaching practice, and why there is of necessity a period of education which can properly and accurately be termed "secondary."

II

THE SECONDARY SCHOOL DEFINED.—The problem resolves itself in substance into a search for that region in the process of schooling within which there are no essential and critical differences in the nature of the process of learning under instruction. Or, to put it in another way, we must seek for the region throughout which there is some outstanding and controlling characteristic of teaching which is not found and cannot be applied earlier and which is not found, or ought not to be found, later.

Such a comprehensible test can, we think, be found in the school procedure in which the pupil is capable of learning through study and the use of books but is incapable of systematic personal growth, except under the constant tutorial presence and constraint of the teacher. This region is the *secondary school*, at least so far as teaching is concerned. There is an earlier period during which the pupil is incapable of that kind of learning because he has not the essential tools, which are ability to read his vernacular, ability to use the fundamental concepts of number, and ability to use the fundamental system of expression which we commonly call "handwriting." The regions within which he is learning the use of these tools and becoming socially adjusted to group existence under school conditions is the *primary school*. There is a period beyond the secondary school during which the student has become capable of pursuing self-dependent study and in which he utilizes the instructor in the same sense in which he utilizes the library, the laboratory, the occasional public lecturer, the office consultant. This region is the *university*. It matters not for our present purpose whether the student resorts to the uni-

versity for research or for professional training or for general culture; in any case, the region in which he is studying is clearly marked off in its essential procedure from the secondary school. If we apply this test, which seems incontestably to be a valid one and to be fundamental, a college in which it is still necessary for students to meet their instructors by regular assignments for purposes of instruction and constraint in the arduous pathway of learning is still a secondary school. A professional or technical school in which this process is still necessary is wholly or in part a school at secondary level, earlier or later, depending upon the extent of the student's intellectual capital which is found needful for purposes of instruction. The mere fact of having completed a given number of years of educational experience cannot in any rational sense be taken as defining the pedagogical nature of the school in which the student finds himself. Nor can a higher institution of learning make itself post-secondary by academic decree, by calling itself "university." It is university in so far as its students are capable of university work. Otherwise, it is a secondary school, whatever title it may choose. The secondary school is thus defined in terms of fundamental and characteristic aspects of the pupil's intellectual growth and personal development.

The reader has a right to a more concrete and perhaps factual description of the upper and lower limits of the secondary school as it has thus been defined.

SPECIFIC CRITERIA IN THE PRIMARY LEARNINGS.—Reading in our terms means the ability to see through the symbolic complex of the printed page to the thought or scene or action which is the subject of the discourse without constant focal consciousness of the discourse itself. To this ability let us apply the term *reading adaptation*. Its essential utility seems to be found in the principle that the person who has arrived at that stage is able to reflect as he reads and consequently to assimilate the subject matter. On the other hand, the person who has not reached that stage but who can nevertheless put together a mosaic of words, of each of which

he is focally conscious, cannot reflect as he reads, cannot assimilate as he reads, and studies with difficulty if at all. Ability to assimilate material in the form of discourse is then one of the primary conditions of study.

Can children study as soon as they have reached the reading adaptation? They can and do, in a primitive and unmethodical sense it is true, but none the less the fundamental characteristic of study is present. They can, by their own efforts, get vicarious experience from books. Before reaching this stage, they cannot do so, but must depend upon the teacher or some other person for that kind of enlightenment which in our time is accessible, either directly or indirectly, on the printed page. They can observe, make associations, and to some extent draw conclusions, but they cannot study in the sense in which that term has to be used in the work of the school. This embryonic study capacity, which arises as soon as the pupil has found his book and can use it, must of course be developed into the systematic methods of thinking which the educated man employs; it must be trained by developing in the individual volitional control and discretion; it must be refined by showing him how to attack his problems in the most economical and effective manner; it must be enriched through the acquisition of cultural content. Such development is the problem of the secondary school, from the time at which it receives the pupil until he leaves school, or until he is fully equipped with those powers and interests which render him educationally self-dependent.

The pupil begins to be able to learn the systematic forms of thinking in which most study is done when he has acquired the elementary concepts of number and has become accustomed to use them in their mathematical relationships. As soon as he can count and, in common parlance, "put two and two together," he has become capable of learning how to study. Prior to the rise of that capacity, even the most elementary truths of nature are accessible to him only as information imparted by the teacher or discovered through his newly found capacity for reading. Given

this modicum of arithmetical ability, he is on his way to quantitative thinking. Nor is it essential that he should wait until he has acquired the whole range of the curriculum in arithmetic. Putting pupils in possession of arithmetic, and mathematics in general, is a vital part of the process of teaching pupils to study, which is the peculiar province of the secondary school.

The pupil cannot begin to acquire the art of study, as an implement of systematic adjustment to the world and the age in which he finds himself, until he has acquired a tool with which to record his learning and through which he can express his reactions to teaching in a more abiding and a more deliberate form than is possible through the agency of the spoken voice. The only tool which we have yet found usable for this purpose in the beginning is handwriting. Apart from the ability which handwriting implies, the individual can absorb information, he can make more or less shrewd deduction from his experience, he can eventually perhaps accumulate the naïve stock of wisdom drawn from the immediate environment, which the illiterate often evinces; but he cannot even begin to attack systematically the accumulation of ordered experience which an advanced civilization presents to him. Just as reading ability puts the pupil in contact with the wider environment, so handwriting enables him to react to the environment in intellectual forms and thus to complete the learning cycle. Nor is it essential, before he can begin to study, that he shall have acquired the skill which penmanship implies. It may doubtless become desirable for him to improve the quality and rate of his handwriting in order to make more effective study possible, and it may later become profitable to him to acquire the handwriting skills which a given vocation employs. These are functions for which the secondary school often finds it necessary to become responsible, but they are not critical of the possibility of secondary teaching. As in the case of reading, so in that of handwriting, the ability which is critical is performance at that stage at which the pupil commits his thoughts to paper without focal consciousness of the elements of the discourse which he

writes. If he can reflect as he writes, he can learn to study effectively, other things being equal. Let us designate this stage by the term *handwriting adaptation*.

The critical importance of handwriting and written expression from a very early period in school has largely been overlooked. Handwriting is more than a school art, one of the three R's. When the pupil arrives at the point at which he can record his thoughts, we have the only picture of his thought life which we can get at. We thus have an objective means of following his thinking and of ascertaining whether he is thinking at all or not. We can induce him to write what he means and that is a tangible instrument for clarifying his thought and organizing his thinking in logical coherency.

When young children enter school, they are commonly at a stage of extreme individualism much like that exhibited by savage peoples. The condition which is normal in the first months of school life is an incoherent mass of social atoms, each aggressive or retiring, depending upon individual attitude and previous experience. Now, apart from the necessity of socialization as one of the fundamental educational products, it is to be observed that all the learning processes of the school have to be carried out under social conditions. Study and teaching are processes of the social group as it is found in the classroom. The set of attitudes and abilities in terms of which the pupil tends habitually to get on with his classmates and to co-operate in the learnings which the school has to administer is then of sufficient importance to be identified as being among the primary criteria of ability to learn by study. Among these attitudes there seem to stand out clearly: (1) primary personal self-dependence, that is, ability to look after bodily needs, getting on wraps and overshoes for example; (2) adjustment to the necessary authority of the classroom (In not a few cases, inability to learn at the secondary level is apparently an instance of intractableness, pure and simple); (3) sense of property rights; (4) the beginnings of ability to work with others. The four taken together may be characterized as

emergence from infancy, or, in every-day terms, *getting over being a baby*. We may designate the critical attitudes and abilities for future reference as the *primary social adaptations*.

Now, all of these primary criteria can be identified in individual children by tests, by symptoms, and by resort to other evidential means, not it is true with absolute precision but with confidence sufficient, in the great majority of cases, to warrant placing individual children in the way of that growth which systematic study and teaching imply.

III

CURRICULUM AND TEACHING DISTINCTIONS.—As the pupil grows onward toward maturity, he becomes capable of experiences which were before impossible. This individual development is evidently critical of what the pupil shall study, but it is not critical of how he shall study and be taught, except in details of method and technique. The latter is far more a question of personal development than of mental development, of what the pupil has already come to be than of how old he is. No doubt, mental, physical, social and intellectual maturity affect details of appropriate operative and administrative technique. For instance, intellectual maturing eventually brings about a situation in which departmental teaching is desirable and feasible, whereas it was not earlier feasible. Social and physical maturing often make it desirable that pupils of the same general level shall be brought together under the same general physical and social conditions. The requirements of this kind of flexibility may at times make desirable separate school organizations similar to our existing high schools and colleges, but there is nothing in the teaching process as such which calls for such separation. A high school does not become peculiarly a secondary school merely by becoming a separate school organization, ministering to a particular pupil population; its pupils have long been in a secondary school before they seek its doors. Nor does a college cease to be a sec-

ondary school merely because it is separately located and organized. *Elementary school*, *high school*, and *college* are convenient administrative terms and not pedagogical or educational terms.

NOT A QUESTION OF GRADE LEVELS.—Our inveterate grade-school thinking impels both writer and reader to raise the question, With what grade should the secondary school begin? The secondary school in the nature of things must begin when the individual has attained the tested primary adaptations. If a given child has perchance reached that level in the third year of school life, his secondary school begins then, and if he is delayed arrested development in the form of aborted cultural interests is likely to set in. If he has reached the end of his primary development by the end of the fourth or fifth year, his secondary period begins then. Experience seems to suggest that most children under effective primary teaching reach the point not far from the age of nine. If the pupil has not attained the primary adaptations by the time he is academically in high school, he is not yet a student at secondary level. There has been accumulated a substantial amount of evidence, published and unpublished, which tends to show that high schools and even junior colleges have not infrequently enrolled students who are in this condition with respect to one or more of the four primary adaptations. Some have never truly learned to read; many more have never acquired the effective use of the number adaptation; not a few are hopelessly handicapped because they cannot work in class groups. For practical administrative purposes, in a school system which is large enough to be subdivided at all, the kindergarten and the first two, or possibly three, years in terms of chronological age should be organized as a single ungraded school, not necessarily in a single room, and when a group of children have come to the primary adaptations they should be sent into the secondary school, not necessarily in another building.

TERMINUS OF THE SECONDARY SCHOOL—THE UNIVERSITY.—The other end of the secondary school is quite as important. It is

not the twelfth grade nor the sixteenth, but rather the point at which the evidence shows that the pupil has matured; that he has attained the intellectual, volitional and conduct responsibility, the fundamental methods of thinking, and the sustaining cultural interests which make him a self-governing intellectual and social being. If he reaches that point at fifteen years of age, he must have his higher opportunity either in his present school or another. If denied and kept within the constraining influence of the secondary classroom, he is more than likely to become intellectually sterile. If, on the other hand, the graduate school finds itself with a student who has never attained intellectual self-dependence, it must choose between letting him go and carrying on for his benefit instruction of secondary grade. The identification of the terminus of secondary education in the individual is a matter of prime importance in the administrative technique of the secondary school, and to this point we shall have frequent occasion to recur.

The teaching of the secondary school is the field which this volume attempts to analyze. All the chapters which follow are based upon the thesis which this introductory chapter has set forth.

IV

In this definition of the secondary school the reader will perhaps find suggestions of the secondary schools of Continental Europe. If we take the German *Gymnasium* as typical of European schools, there is indeed much resemblance. The latter were evolved to meet the needs of people who were going on to the end of the period of general education, and subsequently into professional life. The common schools, the *Volkschule* for instance, were designed to regiment the masses in "that station in life to which it had pleased God to call them." In America, everybody is "going on," and the process of regimenting the American youth at all is apparently beyond our wisdom—let us hope beyond our desires. Given what is much the same problem as that of the Ger-

man secondary school, a reasoned analysis of the American school leads us to much the same conclusion touching institutional organization as that which was earlier worked out in practice by Europeans. Had the American reformers wiped the slate clean of their borrowings, and had they been able to foresee the course which the evolution of democratic society would take, especially in its effect in the expansion of enrolment, it may well be that they would have developed the old American district school into something very like the primary and secondary schools as we have defined them in this chapter.

CHAPTER II

THE OBJECTIVES OF SYSTEMATIC TEACHING

AT THE beginning of the modern period of systematic scrutiny and revaluation of education, in addition to the administrative stereotypes which had grown up in the United States and which have been discussed in the preceding chapter, the student was confronted with two traditional conceptions of the objectives of teaching both of which have very obstinately held their ground and still give way but slowly.

The first of these arose out of the prestige of scholarly learning. From time immemorial, that man whose mind was fullest stored with the erudition of the ages had been conceived to be the best educated, and so education and erudition were thought to be one and the same. The curriculum was formulated with that principle in mind, and teachers were held to be best prepared who knew the most about the subjects which they proposed to teach in the sense of being best informed about them.

The second had its origin in the very human tendency toward propagandism. Man is ever eager to make his fellows hold the views which he cherishes, and the rising generation is always a singularly promising field of attack. Hence the objectives of teaching often tended to become simply the indoctrination of young people in the habits of thinking peculiar to the ecclesiastical or political organization which for the time happened to be in control of the schools. Nor was that all. It matters little in educational principle whether propaganda are administered by a particularly well-organized hierarchy, by the Hohenzollern state, or by dear old Dr. Blank with his fierce "I believe in sound learning, sir." In any case, not the youth and his adjustment is in the foreground but the world-plans of other people. Nevertheless, there is perhaps no point in the whole domain of education in

which the line is harder to draw than here. The fundamental law of societal evolution seems to rest on the ability of each generation to transmit its productive and useful learnings to the next generation. Conceived as the transmission of a static social organization, the law is the explanation of the propagandist; but to abandon the principle altogether is to set society back to the point at which it began to evolve out of the chaos of the horde, in which every man did what seemed right in his own eyes, limited only by his endowment of brute strength.

I

NATURE OF THE TRUE LEARNING PRODUCTS.—And yet common sense and a modicum of knowledge will give anybody a very obvious conception of what the products of actual learning and teaching must be, and enable him to distinguish between what is learned and what is not learned. In general, any actual learning is always expressed either as a change in the attitude of the individual or as the acquisition of a special ability or as the attainment of some form of skill in manipulating instrumentalities or materials. Let us illustrate. The person who has genuinely acquired the conceptions which make up the atomic theory, or the principle of natural selection, has acquired a new attitude toward the world in which he lives. He does not and cannot react to nature as he did before. More than that, he cannot lose this new attitude, except as it is modified and refined through the attainment of other new attitudes. For example, his attitude toward the physical world which is represented by the atomic theory may be superseded by that which is represented by the electron theory. Some of his attitudes may be perverse and resist enlargement or transformation and these we sometimes call prejudices. He who has genuinely acquired a given conception or set of conceptions in the field of social relationships—let us say the notion of liberty under the law—has acquired a new attitude toward his relationships with his fellow-men and toward the relationships of these with one another. There is no question of his losing this

attitude or of forgetting it. He can no more lose it than he can lose the native tendencies which he has inherited from his progenitors. But the attitude can be replaced by subsequent perverse learnings and we call the outcome disillusionment. More than that, the new attitude inevitably modifies his whole social behavior; he conceives new ends and adopts new means. Once more, the individual who has genuinely acquired a new notion of duty in the moral world is a changed person; his attitude toward his behavior in the world of conduct is different from what it was before; his behavior itself is inevitably different.

Turning to the acquisition of special abilities, let us use the ability to read as an illustration. When the pupil has reached the level which we have identified as the primary reading adaptation, he has undergone a real change in his personal organization. There is nothing here which can be lost. Many of the skills associated with reading may be lost, through disuse, and this loss may amount to temporary atrophy of the adaptation itself; but the adaptation is quickly restored in a situation calling for its use, if it was ever present at all. Furthermore, with the adaptation actually established, the pupil does read, in all the multitude of situations in which reading is desired, for the purpose of gratifying curiosity or seeking entertainment. So it is with the reading of a foreign language, or the performance of bodily exercises like swimming or skating or dancing, or the use of a method of thinking such as, for instance, the solution of the quadratic equation.

The third fundamental type of learning products is that for which we shall use the term "skill." Without attempting to settle the question of the nature of skill or the appropriateness of the term itself, we shall ask the reader to connect its use in this volume with the meaning to which we apply it. Within our meaning, "skill" is nearly synonymous with "facility." When a pupil has attained a given adaptation, with all that implies, he has frequently to go on and acquire certain skills in the application of his new attitude or ability to the situations which call for its use. In the case of the reflective adaptations like those arising out of

the concepts connected with the atomic theory, or natural selection, or liberty under the law, skill seems to consist largely in the facility with which the individual identifies the elements of situations which are subject to interpretation in terms of his new attitude. In the case of special abilities, like the ability to read the printed page, the associated skills are such matters as rate of reading, rate at which reading can be assimilated, and perhaps some others. In the reading of a foreign language, the associated skills which are built up on the basis of the reading adaptation can in general be described as fluency. In the practical arts, the skills are comprehended in the term "facility in execution."

And so we can say that the learning products which constitute that process of individual adjustment to the world which we call "education," and which are the objectives of teaching, are always either *attitudes* or *acquired abilities*. We shall think of attitudes as being always either *attitudes of understanding*, where reflection and rationalization have been involved—found typically in the field of the sciences; or *attitudes of appreciation*, where the acceptance of values has taken place, in the form of beauty, goodness, love of the truth. We find *abilities*¹ in the use of language, in the performance of music, in walking, swimming, skating, and a host of other activities of which these will stand as illustrations. Skills we have already defined, but note that a skill is not a personality adaptation, for it is readily lost. It is, however, a temporary adjustment.

DISTINCTION BETWEEN LEARNING AND SUBJECT MATTER.—Now as soon as the teacher comes to see the objectives of teaching in these terms, the whole process takes on a different aspect. He

¹ It seems to me that teachers, and educational thinkers in general, would be saved a world of confusion if they would get in the habit of distinguishing between *ability* and *capacity*. Ability implies something specific while capacity is general. In the recent period of absorption in theories of "native intelligence," the term ability or natural ability has tended to be appropriated to this meaning. Much better to restrict "ability" to specific instrumentalities like reading and use "capacity" to mean either the native adaptability of the organism itself or the acquired capacity of the educated personality.

sees that the subject matter used in the school is not valuable in education for its own sake but only as it is serviceable in generating intelligent and useful inclinations and abilities in the pupil. He sees that while we all learn from experience we do not learn experience. More important still, that we do not learn what to do but that we become the kind of persons who will sense and feel what is the right thing to do and possess the specific ability required for its execution. He has a new and more valid criterion of curriculum material and of teaching procedure. He can distinguish more accurately between the region of general education in which the adjustment of the pupil is the center of effort and the region of the University where knowledge is in truth valuable for its own sake.

The view thus set forth of the nature of the essential products of learning is one which has been evolving throughout the modern period. The efforts of the Herbartians, the supervised study movement, project teaching, the direct teaching of the modern languages, improvement in primary methods, the educational measurement program, the contributions of educational psychology—all have tended in the direction of identifying, describing, and measuring actual products as contrasted with routine and formal products expressed in terms of time-to-be-spent, methods-to-be-followed, ground-to-be-covered, or in terms of erudition or information.

II

PERSONALITY ADAPTATION.—We have already picked up and used the term “adaptation.” Perhaps it is time that we defined the term more explicitly, for we shall need it as part of the terminology of our study throughout the volume.

The biologist makes very large use of the term, and by it he means both the process and the result of the modification of an organ, or indeed of a whole organism, so that the plant or the animal concerned is brought into a state of better adjustment to the environmental conditions which it must meet. Thus, by a long series of adaptations a creature has been evolved who walks

erect, and we call the creature "man." Similarly, man owes his vastly superior mentality to a long series of adaptations in the physical organism an essential part of which, but by no means the only part, is the human brain. In brief, organic evolution is a story of manifold adaptation by which, on the whole, higher forms of life have been produced and in the process have been brought into better and more comprehensive adjustment to the environment.

In much the same fashion, the individual human being goes through a process of adjustment to the world in which he must live; only this is learned rather than physical adjustment. In other words, he learns how to live. The successive learnings in the process are adaptations in much the same sense as the innumerable steps in the evolution of the physical organism were adaptations.

The single type of learning product to which I think this analysis and the term "adaptation" do not apply is that comprehended in the category of skills.

The adaptation is a unitary thing, and the pupil has either attained it or he has not. Individuals may differ greatly in the length of time and the ease with which they take on the change which a given adaptation implies, they may differ in the convincing character of the evidence touching the presence of the adaptations which their behavior reveals; but, if two pupils have attained a given adaptation, they cannot differ with respect to the fact of their attainment. Skill, on the other hand, is essentially a variable. Any individual can be at different points on the curve of skill development at different times, and it can truthfully be said that at each point he has some skill. Two individuals can differ widely in skill and yet each possess skill. It is often critically important in pedagogical analysis to determine whether we are dealing with an adaptation or a skill.

PERMANENCE.—The ultimate test of a product of learning which has involved a genuine adaptation is that it is not lost, otherwise than through its transformation into new adaptations

or through the rise of pathological inhibitions. It is never lost by simply fading out. A position so at variance with the common experience of school people calls for some elaboration and for the presentation of some evidence.

The author has asked his classes of mature teachers to list the products which they had acquired more than ten years ago, which have been in disuse for at least ten years, and which can be performed today substantially as well as ever. There always results a list of learnings ranging from early attainments on the farm, or in the household, to ability in the use of some musical instrument. In some cases, the students have been interested enough to verify the permanency of their original learning by experimental tests. The person had learned to swim, and after a lapse of years of disuse he can still swim. Another had learned to bake good bread and can still do so. History and mathematics and science and foreign language had presumably been learned, at least the student had been tested and had been "passed," but all this is as the snows of ancient winters. Violin-playing had been learned and the product abides; the translation of Latin had been "credited" and scarcely a fragment is left, not enough to render into English a sense of the wording of the diploma which certifies the student's degree. And yet some typical school products are often still as vigorous growths as ever, after the lapse of years of disuse. In nearly every such case, however, it is observed that the product had at some time been used in a functional sense. In this person, learnings in the field of physics are left, but it is noted that he taught physics for several years after leaving college. In this case, arithmetical learnings are as functional as they were when the student was preparing for examination, but he has had occasion to use arithmetic every day in a brief business career. Any reader can readily test himself, and with rare exceptions he will find that his own learning history is in conformity with these histories which have been described.

Why does it happen that some learning persists and other learning fades out? The answer is obvious: Some things were in

fact learned and others were not. Some had amounted to actual adaptations; others had been mere memory content, good until after examination and then lost.²

III

THE LEARNING UNIT.—Now the learning product itself is of course inward and subjective in the learner, but, since the learner lives in a world to which adjustment must be made, there must be an external and objective correlate of the learning—that is to say, a thing to be learned as well as a learning. Thus, the equation in mathematics is the external while the inward personality accretion in terms of which the individual's thought processes take the form of the equation in appropriate situations is the learning product or personality adaptation. Again, the art which we call reading, whether in the vernacular or a foreign tongue, and which we can define with a near approach to exactness, is the external, while ability to read is the internal, acquired, personal character-

² Since the first edition of this work was published, there has perhaps been no position taken therein more frequently attacked by critics than this notion of the abiding character of the true learning products.

As is prone to be the case, disagreement in most instances results from ignoring definitions. If content in memory is held to be of the essence of true learning, then learning undoubtedly fades out, unless to be sure it is made the product of mere repetitive drill described in chapter xxvi. But to hold that such is the nature of true learning is tantamount to holding that education is incapable of revealing itself in modified behavior patterns, or in effect to hold that there is no such thing as education, beyond the crass journalistic use of the term in which education is synonymous with propaganda and advertising campaigns. To hold, on the other hand, that not even behavior patterns are abiding is to run counter to a mass of evidence which in the aggregate is very imposing.

Not only is common experience full of instances which can be interpreted only on the theory that essential learning is a lasting contribution to the evolution of personality, but abnormal psychology describes cases which are susceptible to no other interpretation.

Every instance of *fugue*, a condition in which an individual disappears from his accustomed surroundings and eventually returns in safety or is found in safety in some other locality, with no memory of his doings, is a case in point. He must have carried with him his whole personality adjustment, for otherwise he would have perished or would have been taken into custody as a helpless vagrant.

The literature of hypnosis reveals characteristic instances in which the behavior

istic of the individual. Once more, the Industrial Revolution is an external interpretation of social and economic evolution, a thing to be learned. The learning itself is the correlated internal attitude of intelligence and understanding with respect to the structure of society. Finally, obedience to constituted authority is an external, objective requirement of life in civilized society. The internal value attitude which corresponds is a mark of civilized personality.

Hence we may define for our purposes the external things-to-be-learned as *learning units*, and further define a serviceable learning unit as *a comprehensive and significant aspect of the environment, of an organized science, of an art, or of conduct*,

of subjects is controlled by suggestion up to the point at which immoral behavior is suggested and there the process is blocked by the presence of an established personality adaptation.

In cases of defensive amnesia, such as those occurring in "shell shock," the patient's essential personality is frequently left intact, with complete loss of all that constitutes the memory system. Some instances are recorded in McDougall's *Abnormal Psychology*, notably pages 244-45. In one case the soldier had no recollection of his name, regiment or even marital condition, but was in possession of such arithmetic as he had learned.

In brief, the memory system seems to be a more or less fruitful record of learning, as it is of other experiences, but it is not learning.

The cases which are found in the loss of language learning are perplexing and seem often to furnish indubitable evidence that at least some true learnings are lost. And yet, under hypnosis or in delirium, language learnings which the individual declares that he has irretrievably lost sometimes reappear. Two comments are called for.

In the first place, we often believe that we have learned a foreign tongue when in reality we have not. Language-learning which amounts to a personality adaptation probably always implies that the individual does his thinking in terms of the other tongue. Those of us who have "learned enough to get along" have only a temporary adaptive response in which we translate or transverbalize our vernacular into the alien idiom.

In the second place, language learning is a special case under the general law of learning anyway, since the language becomes a part of the fundamental logical thinking system. A foreign language may at some time, perhaps in infancy, have indubitably been learned in the true sense and yet, since the individual does all his current thinking in his vernacular, the adaptation in the foreign tongue is replaced, much as new learnings in science sometimes replace old learnings.

which being learned results in an adaptation in personality. Certain cautions are to be noted in passing.

The term environment must not be understood as limited to the physical external universe. Within our meaning, our own bodies are part of the environment. More important, the institutions which constitute the working fabric of society are environment. So is the great body of cultural inheritance found in literature and religion and in the products of the fine arts.

Organized science, whether it be grammar and mathematics or the physics, chemistry, biology, and economics of the late secondary period, we differentiate from the environment. It is true that organized science in its applied form is useful as a method of attack on the environment, but it is not the same environment which it interprets. The pupil at one level learns his environment as a thing having meanings which are explained by science. At another he learns physics or chemistry, and all along he learns grammar and mathematics.

"Art" is the name of a method of doing things. For example, reading is an art. We are not using the terms in the colloquial sense which fails to distinguish between arts and the products of the fine arts.

"COMPREHENSIVE."—The term "comprehensive" means that the unit must have wide connotations in order that it may be an economical feature in the program. For example, the *Westward Movement* as a unit in American history is comprehensive because it explains so much. The *Banking Policy of Jackson* would satisfy the requirements of a unit, since it suggests an understanding or insight, but it would not serve as a feasible unit in the secondary school for the reason that it explains relatively little of our history.

It is this test of comprehensiveness which explains why it is that a unit in the early secondary school may become a full course at the end of that period, and a broad field of professional study in the university.

“SIGNIFICANT.”—The unit must be not only comprehensive but significant, that is, it must be important in the field of general education. *Indirect discourse* is comprehensive but it shrinks to the immaterial in educational significance compared with *reading ability*, because it contributes little or nothing to fundamental adjustment.

A PROGRAM TERM.—“Learning unit” is a program term. It calls for the organization of the program of studies in units rather than in informational subject-matter content. If we could accurately define adjusted and integrated personality, and fit all units accurately to inward learnings, education would be an exact science; and education is not an exact science. Nevertheless, by process of reasoned analysis and experimental verification in the classroom, we can make extended progress on the road the terminus of which is an exact science. In this sense, education defined as the evolution of personality and implying the school organized in learning units is a science after the fashion of economics and jurisprudence and not after the fashion of physics and chemistry; but it is an immature science.

The question is often asked, Is there any way of objectively determining the appropriate learning units? If by “objectively” is meant mere direct inference from factual material or the application of mathematical formulae, there is no objectivity whatever about the units. If “objectively” means judgment founded on valid reasoned analysis and faithful to pertinent facts and principles, in the place of mere subjective fancy and speculation, then the unit analysis of a course is as truly objective as any other process in science.

If the customary test of reliability is applied, namely would two different investigators find the same set of units, or the same investigator at two different times, then the reliability of any unit organization is very low. But so is any scientific procedure which has not arrived at the stage at which valid mathematical interpretation is possible. All the inductive sciences would have died a’borning if any such test had been insisted on. Two ma-

terially different sets of units for a given course may either of them furnish valid and useful interpretations. Nevertheless, given two investigators, both of them thoroughly versed in the unit principle and both of them thoroughly acquainted with the subject matter of the course being organized, the two will tend to agree in their final decision, provided the two minds have an opportunity to meet in conference and in possession of relevant facts.

LEARNINGS WHICH ARE NOT UNIT LEARNINGS.—It must not be supposed that all learnings are unit learnings. The latter are structural elements in the school program and, if wisely chosen, the correlates of the structure of healthy personality. Nevertheless, the individual learns quite independently of the school and of even the best systematic teaching.

In the first place, given two individuals both of them possessed of the same fundamental structure of personality, and that the personality of civilized man, the two will take on an indefinite number of subsidiary, or what might be called interstitial, learnings, depending upon temperament, experience, and native capacity. Thus does individuation arise.

On the other hand, every immature pupil is liable to perverted or mistaken learnings, which he acquires in the process of random application of the structural learnings. The real teacher, whether trained or untrained, is constantly on the watch for the identification and correction of these perversions in individuation. Not infrequently, such perversions amount to or lead to actual emotional pathology and that is the region in which the fields of the teacher and the mental hygienist overlap.

IV

LEARNING PRODUCTS AND ASSIMILATIVE EXPERIENCE DISTINGUISHED.—A systematic and analytical view of the real product of learning thus suggests that there are many activities in the routine of the classroom and of instruction which never become real products at all and which in the nature of the case should not

be viewed as such, even in prospect. *In general, these activities are for the most part those which contribute the assimilative material out of which the real products arise.* May we illustrate at some length.

Let us assume, to use one of our former illustrations, that the student has really learned the use of the quadratic equation. The learning product here amounts to an actual modification in his methods of thinking. In the process of attaining the adaptation, he has been obliged to work through a great many illustrations of the process itself and of applications to concrete situations. He has taken in, it may be, many explanations made by the teacher. All of this experience is assimilative material out of which the adaptation does or does not arise. In our illustration, we assume that the adaptation does arise. Now, the factual and experiential material which has thus been used does, and should, very promptly fade out of memory. Some of it, as well as wholly new material, might be used in testing for the presence of the adaptation, but the material itself is never a learning product. The pupil has learned from experience but he has not learned the experience.

A unit in history may be, frequently is, the French Revolution. The objective here is an adaptation, a new attitude toward the past, described perhaps as a conviction of the nature and inevitable consequences of a long period of personal government. In the process of attaining the conviction, the student listens to the teacher's explanation and reads a great deal. He experiences through his reading the arrogance and egotism of Louis XIV and the excesses of the reign of Louis XV. He becomes acquainted with Voltaire and Rousseau; with Mirabeau, Danton, and Robespierre. He shudders at the horrors of the Reign of Terror. Some of these experiences, like some of the experiences of childhood, may become so firmly fixed in memory that they do not fade. But they are no more products in learning than are the memorable experiences of the daily life. Out of them arises or fails to arise the attitude which the teacher is striving to develop. It is the attitude which becomes the real and serviceable product of learn-

ing and not the experiences themselves; these may fade out of memory but the conviction abides. Conversely, there may long be retained mere memories of isolated facts, without any modifications of attitudes whatsoever. In this case the individual has learned nothing, and, so far as the unit itself, in this case the French Revolution, is concerned, he will remain intellectually sterile.

Again, the teacher may be developing an appreciation of the beauty of a lyric or the truth of a drama or a refined taste for the short story. He is, or should be, aiming at a series of individual adaptations. If the taste is actually developed, it is a contradiction in terms to say that it is forgotten. If the beauty or the truth is really seen and accepted, the statement itself means that a new attitude is discovered. Now in the course of this learning, a great deal of reading is done and the teacher perhaps talks a great deal as he endeavors to bring about the changed attitude which he is seeking to effect. In other words, the pupil passes through a body of assimilative experience. Assuming that the new attitude has been acquired, it may very well be that the greater part of the experience itself fades away. The adaptation is revealed by the change which takes place in the character of the reading which the pupil now selects. Erudition in the form of knowledge of some pieces of literature read, of their rhetorical and linguistic structure, of the history of their production, is in itself no evidence that beauty and truth have been felt and accepted or that tastes have been formed.

So much for the adaptations which are in the form of understanding or appreciation. Let us now turn to those which are in the form of abilities.

The child, in learning to read his vernacular, practices for one, two, or it may be three years, in the use of reading material. In common parlance, we say that he learns to read by reading. All along, he gets meaning from the printed page, and he may be tested with positive results. Nevertheless, he does not read of his own accord and ordinarily does not attempt to do so. He eventually,

however, attains the power to read and manifests that power by seeking his own reading material and becoming absorbed in the content. He has attained the adaptation at the level of which he looks through the discourse and beholds the scene beyond. Frequently his learning stops short of the reading adaptation and then such power as he had is apt to be lost. A very large proportion of the non-readers in society, such as those who were revealed by the famous army tests, are very probably individuals who have passed through the routine of the reading classes in the primary school but have never learned to read. Now the period of practice prior to the adaptation is clearly a period of assimilation. Performance which is merely an incident of assimilation is not the true learning product sought. Even with the recent devices for testing reading power, such as oral, rate, and comprehension tests, it may well be that performance may be taken for learning—with disastrous consequences.

There is another set of ability adaptations which we must bring into the picture, namely, those which are acquired apart from any thought process whatever. Among the schoolroom arts, spelling is the best illustration. Better illustrations are found in the extensive list of pure neuro-muscular adaptations such as walking, swimming, skating, and the like. Here the adaptation is apparently in the form of a set in the co-ordination of a system of neuro-muscular adjustments. The adaptation is attained through a period of practice during which for a long time it is in doubt. In the end, it is evidenced by reliable use apart from guidance or constraint. Contemplate, for illustration, the small boy learning to swim. He struggles aimlessly for some time. Presently he can maintain himself in the water and progress for some little distance. He proudly asserts that he can "take twenty strokes." The veteran knows that even though he can take a hundred "strokes" he cannot yet swim. But one day to his astonishment and delight he finds that he can maintain himself indefinitely. The adaptation has taken place. The veteran's verdict is, "Yes, you can swim." In a similar manner, children practice spelling

for a long time. They are tested and make no mistakes. The teacher and the supervisor are satisfied. Nevertheless, on the next written paper several words, upon which the pupil was impeccable in the test, appear as misspellings. Lesson performance had been mistaken for the real product. Eventually, the pupil spells these words correctly, apart from inadvertences of one sort or another, he always so uses them, and he does so automatically. The ability adaptation has taken place.

V

TEST FOR THE PRESENCE OF THE LEARNING PRODUCT.—The test of a real product of learning is then: first, its permanency; and second, its habitual use in the ordinary activities of life. Indeed, so fundamental is the latter of the two tests that any truly educated person can appraise the whole education of his fellow in its terms. He can note, for instance, how the latter forms his opinions. Does he accept the ordinary cant of the day as his opinion? Most people do. Or does he critically examine the facts, apply the principles which he is supposed to have learned in school, and render an opinion in which all reasonable educated persons must concur? Does he hold opinions on all subjects under the sun, as the illiterate is prone to do, or does he distinguish between those fields in which he is entitled to hold opinions and those in which he can have no possible basis for opinion? If he has been credited with certain courses in economics in college, does he apply economic thinking to the interpretation of commercial situations in which he finds himself, and to the decision which he makes when he votes for a new tax, or does he live the life of the economic opportunist? If he has been credited with certain courses in English literature, are his attainments reflected in his choice of cultural reading or does he solace his leisure exclusively with the Sunday newspaper and the ephemeral story of the day? In the course of Part III, we shall have occasion to study in detail at various points the theory of valid testing as applied to the various products of learning. Suffice it here to state that, however tests

may differ, we shall always find ultimate reliance in two forms—the assimilation test, which seeks to determine whether or not a given adaptation has taken place; and the behavior or functional test, which seeks to verify the assimilation test through observation of the unconstrained behavior of the pupil.

An illustration of a successful behavior test is found in the following incident.

An observer was visiting a "Community Life" course at junior-high-school level. The unit which was being studied, and which had been in the process of being studied for some time, was "Myself and Others." The teacher had not only been guiding the class to an understanding of the principles involved but had been endeavoring to make register the significant application to the pupils' attitude toward conduct. The teacher chanced to step out of the room and was absent for a considerable interval. Everything went on as it had gone on during the presence of the teacher. At the end of the period, the observer followed eight of the class to a room in which there was great disorder. The eight behaved precisely as they had in the room from which they came. The behavior in the social-studies room was clearly the result, not of conformity, but of a true adaptation.

VI

THE GENERALIZED ADAPTATIONS.—It remains to survey the more generalized adaptations which are essential, not only as final products in the education of the individual, but also as means in the development of the specific adaptations. Perhaps the most obvious of these is that which is implied in the expression "learning to think."

REFLECTIVE THINKING.—The educational exhorter has indulged in a great deal of vagueness in the use of this expression and, while teachers have felt a conviction of need, they have been obliged to grope in a great deal of confusion.

Thinking, as the psychologist views it, is simply a period of mediation in the higher nerve centers between the reception of an

incoming impulse and its discharge in some form of re-establishment of neural equilibrium; or, viewed in mental terms, it is a period of reflection intervening between stimulus and reaction. Further, reflective thinking at least is a characteristic of the learning process in but two of the five types into which we shall later divide the teaching process, the science type and the practical arts type. Thinking is essentially problem-solving, the interpretation of novel situations. It is human nature to think, contradictory as this statement may seem to the facts of common experience. People no doubt differ very greatly in their innate thinking capacity. Some cannot think at all, and we set these aside as mental defectives. Some think rapidly and others slowly, depending probably upon the quality of the adaptive organism itself. On the whole, however, all normal people think, or at least can think. Failure of children and adults to give any concrete sign of the process is due rather to absence of the conditions under which thinking takes place than to lack of training in some abstract sense. We can say with a great deal of confidence that, given: (*a*) material to think about; (*b*) a method of thinking; and (*c*) a motive for thinking, any normal individual will think within the limitations which his inherent organic mental structure determines. These are the conditions under which thinking takes place.

The reader can amply verify the statement just made by calling to the bar evidence which is within the experience of nearly everybody. Illiterates, or near-illiterates, are not infrequently found who, within a field which is their own and in which they are actuated by compelling motives, think as effectively as the most highly trained can think in that particular limited field. Contemplate, for instance, a transaction between an untutored ancient horse-trader and, let us say, a university professor. It would be a bigoted advocate of culture, indeed, who would assert that the academician thinks out the situation any more effectively than the salesman. The latter has material, that is, he knows what he is talking about; he has a powerful motive; and he has a crude

method, sufficient for his purpose, which he has built up out of his experience of the ways of the buyer. Not infrequently absolute illiterates think so well in one of these specialized situations that they build up for themselves somewhat elaborate methods.

What, then, is accountable for the superiority of the highly educated in thinking capacity? In the first place, they have enjoyed a vastly greater range of experience, both direct and vicarious, than have the untutored. They have more to think about, and by consequence a greatly extended range of interests. Hence the range of impelling motives is likewise greatly extended. But, more important than all else, they have come into the possession of a variety of methods of thinking which are sealed books to the uneducated. Mathematics, the various physical and biological sciences, mechanics, economics, politics, linguistics, history—all are primarily methods of thinking and only in a secondary sense bodies of informational content. In addition to these are the rational controls of accurate thinking which grow out of inductive and deductive logic. Some or all of these methods of thinking the educated man has acquired, and he thus possesses a trained mind in the sense that he has the intellectual instruments needed for the interpretation of a wide variety of situations.

Hence, the process of training pupils to think is nothing else than furnishing them with an abundance of the vicarious experience made possible as soon as the reading adaptation has been established, and establishing the adaptations which are implied in the study of the sciences. The student who has actually acquired the true products in the learning of physics has by the very fact learned to think as the physicist thinks. He who has really learned his history has acquired historical-mindedness, and so on.

CULTURAL INTERESTS.—Finally, we come to the two major products of the secondary school: (*a*) a wide range of interests and the discovery of some dominating interest, and (*b*) the capacity for self-dependent intellectual life. A cultural interest may be defined as a cultural pursuit which the individual follows independently of the constraint of the school; and educational self-

dependence as that stage at which the student has realized the meaning and purpose of study, has acquired the self-control which self-dependence implies; and has further acquired the range of methods of thinking and of study which remove him from constant dependence on the teacher.

Now, from a very early period in the secondary school, genuine cultural interests begin to manifest themselves, provided the opportunity is afforded. The chief opportunity is exposure to a wisely selected stock of books and other cultural experience. Such interests are easily identified and recorded. Normally, a child passes from one interest to another as experience broadens and new experiences in the course of mental maturing become possible. In time, there seems to be discovered to the pupil the field in which his permanent interest lies. Though it is probably not true that this final discovery necessarily occurs in the secondary school, several cases have been noted in the laboratory within the few years just past in which it is clear that approximate final discovery has taken place before the end of the eleventh grade.

Educational self-dependence before the end of the high-school period probably occurs more often than is noted and, if given its chance, would become apparent. On the other hand, it is certain that it frequently fails to appear by the end of the four-year college period. We are not concerned here with the administrative technique which gives independence its opportunity and if need be forces it. That discussion must be postponed to later chapters. We are concerned with calling attention to the principle that it is one of the learning products of the school, and probably the essential product in a democratic society. As such it can be observed, noted, and tested like any other true learning product.

CHAPTER III

LEARNING AND PERFORMANCE

I

MASTERY.—When a student has fully acquired a piece of learning, he has mastered it. Half-learning, or learning rather well, or being on the way to learning are none of them mastery. Mastery implies completeness; the thing is done; the student has arrived, as far as that particular learning is concerned. There is no question of how well the student has mastered it; he has either mastered or he has not mastered. It is as absurd to speak of degrees in mastery as to speak of degrees in the attainment of the second floor of a building or of degrees in being on the other side of the stream, or of degrees of completeness of any sort whatever. The traveler may indeed be part-way across the stream, he may be almost across, but he is not across until he gets there. Once across, he may continue his journey indefinitely, but he cannot continue his journey from midstream. The pupil may have begun to learn, we can see that he is making progress, he has almost learned; but he has not mastered until he has learned. He may continue to other masteries, and there will be all sorts of degrees in the number of masteries he attains. He may acquire skill in the application of his learning, and there may be an infinite number of degrees in his skill as he improves from no skill at all to expertness. There may be, and commonly are, degrees in the convincing character of the evidence from which we infer mastery. But in the unit learning itself there are no degrees; the pupil either has it or he has it not. We may then apply the term in substance to the true learning products which we have studied in the preceding chapter, and affirm that whenever the adaptation in the individual which corresponds to a given product in learning has taken place, the in-

dividual has arrived at the mastery level for that particular product. Thus, the child who has reached the primary reading adaptation and can actually read may be said to have reached a mastery level. The pupil who has actually acquired that view of the material world which is implied in the atomic theory has attained a mastery level. He who has attained a new and better taste in the reading which he cultivates has attained a mastery. Similarly, the student who has reached the level of intellectual responsibility is a master at a vitally important stage in his intellectual and volitional development.¹

Now the whole process of education, of adjustment to the objective conditions of life is made up of unit learnings each of which must be mastered or else no adaptation is made. These unit learnings cannot be measured but they can all of them be evidenced by symptoms or signs revealed in the learner's behavior. Some symptoms are plainly manifest if we observe thoughtfully; others can be detected only by tests designed to bring them out; others still can be observed only by the methods, and it may be only with the help of the instruments, of the skilled psychologist. Whatever the test, its purpose is to throw light on the question, Has the pupil learned or has he not?

¹ The term mastery is to be found in the literature of education ever since there was a literature, and, so far as I am aware, in the sense in which it is used in the present work. Nevertheless, some writers demur and say "granted all that, we not only need no masteries in general education, but on the contrary they are undesirable." Two reasons are commonly cited:

On the one hand, it is held that society is evolving so rapidly that if an individual entertains any convictions they will make him unadaptable to changing conditions. Much is made of the revolutionary disclosures of science.

On the other hand, it is urged that young people need not masteries but intelligent access to authoritative sources of information.

It is no doubt true that the social movement is at present very rapid, but changes take place far more as the result of the application of old knowledge and of the extension of old principles than as the consequence of revolutionary turns in science. Outside of the newspapers, science is anything but revolutionary. It is doubtless true that the current devotion to research as a method of attacking problems in applied science has resulted in frequent fundamental changes in medicine, engineering, business administration and so on. During a full century past, however, discoveries in science which have been of such a character as fundamentally

It follows that the course material which we find in the curriculum is valuable in education only as it is analyzed into significant units of learning which generate adaptations in the pupil and in that way contribute to his adjustment. It is meaningless to prescribe a course in arithmetic or English or grammar or French, and let it go at that. The issue is not learning any of these but rather the mastery of certain significant learnings in arithmetic or English or grammar or French. The most learned of scholars would hesitate to say that he had mastered any of these fields. But the child of nine years can indisputably learn to add and to identify situations within the scope of his own experience in which adding is the appropriate process. When he has done so, he has mastered that unit and will never know how to add arithmetically any more truly than he does now, albeit he can improve almost indefinitely in the skill and accuracy and acumen with which he applies the process. He can expand his experience until he is applying his original learning to situations which were beyond imagination when he first acquired the learning in question. Similarly, the boy in junior high school can indisputably learn to read French, that is, he can learn how to use the printed page in the manner which has the characteristic symptoms of reading.

to affect the outlook on life and the methods of thinking of the educated non-professional man can be counted on the fingers of the two hands and probably on those of one hand.

More than that, it is plainly the laymen who mastered the elementary essentials of physics, chemistry, biology, economics and government thirty or forty years ago who have all along been assimilating the new viewpoints of the specialists. I much prefer to undertake to convince an individual who knows what I am talking about of the validity of a new point of view in education or economics or government than to essay the same task with a person to whom my language is all Greek. If I am impatient, the former seems prejudiced, whereas in fact he is merely critical. The latter will absorb anything I say if he thinks I know. It is the people who never mastered anything in their lives who are credulous about the immense mass of pseudo-science which burdens the United States mail and crowds the lecture platforms.

The notion that intelligent access to the sources of authoritative information is incompatible with actually knowing something of the fundamentals of the information itself is incomprehensible to the present writer.

He masters the unit of learning which corresponds to the reading adaptation in French. He reads as truly as anybody ever reads. Nevertheless, as experience and ideational content expand and integrate, he comes to be able to apply his reading ability to subject matter which was at first entirely beyond his grasp. In brief, while it is idle to speak of mastering a given field of knowledge, at least in the secondary school, it is not only entirely possible to master important learnings within that field, but no less attainment constitutes learning in the educational sense at all.

II

PERFORMANCE AND LEARNING DISTINGUISHED.—As we have repeatedly seen, these learning products which contribute to and constitute the education of the individual originate in experience. Now the manifestation of experience which is involved in the learning process constitutes *performance*. Further, the application of a learning product, after mastery, in its appropriate use, is performance. In neither case, however, is performance itself a learning product, any more than is the experience out of which learning arises. The relationship can perhaps graphically be represented in the following diagram.

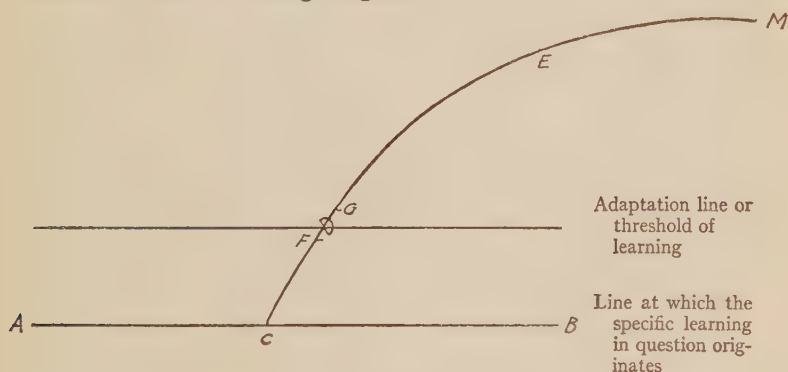


FIG. I

AB may be thought of as the level at which the new learning begins to differentiate from the general *apperceptive mass*, that is,

the ideational and experiential background. CDEM is the performance line. From point C the pupil is practicing. The practice may be in the form of reflective thinking, or of contemplation of material and instruction intended to lead to a product in appreciation, or of language, and so on. As he continues to practice, his performance becomes better and better up to point E at which the level of diminishing returns begins, and finally he reaches some point like M at which further practice ceases to yield results. Now at point D he crosses the adaptation line, or the line at which the true learning product appears. His performance is not different *in kind*, objectively, from D onward from what it is in the interval C D; but between F and G a momentous change has taken place. At F, learning has not registered; at G it has registered. Beyond D, *skill* in the use of the learning product is developing. Below D it is a misuse of terms to say that there is any skill at all. Performance can be measured but the learning product cannot be measured: its presence can be revealed only through characteristic symptoms.

The diagram is only a very generalized representation. In some cases, performance collapses, more or less, above the adaptation line and the associated skill becomes qualitatively a different kind of performance than that seen in the line C D. A striking instance can often be seen in the learning of handwriting. Any experienced primary teacher will have noted that children who are practicing in the region C D frequently develop a handwriting form which, on a quality-of-performance measure, scales high, and which is, nevertheless, drawing and not handwriting. After such children make the handwriting adaptation, performance frequently falls off in quality but now they are writing whereas before they were drawing.

This chapter would be uncalled for, were it not for the fact that much traditional school practice, and much recent scientific study, ignore the mastery of the true units of learning and in place thereof focus attention on the pupil's performance of assigned tasks. Common practice is to treat either the content of a text-

book, or the syllabus of a course of study, as the learning product to be achieved. The content is then broken up into a series of sections called "lessons," or exercises, each of which is conned by the pupil and in one way or another is delivered to the teacher in the form of a recitation or exercise paper. The process of instruction may be varied by class discussion of the content, by the setting of problems, or by other practices which tend to stimulate reflection, but in the end school work is simply a process of covering a given body of narrative, descriptive or expository discourse, or of solving a given series of problems. Within the textbook, especially in science and mathematics, may appear the true learning products contemplated by the course, in a more or less learnable form, but more often the content is merely assimilative material related or unrelated to the essential learning products. The ground once covered, it is "reviewed" and the recitation form of testing the absorption of material is summarized in another test, of the same sort and of the same order, known as the "examination." As the examination period approaches, the teacher and the supervisor alike often exhibit the height of scientific ingenuousness by creating a situation which is skilfully calculated to obscure the very symptoms which they are presumably seeking to discover. The performance stereotype is in full charge in the teacher's mind. Such being the case, it is perfectly logical to review and prepare for examination, in order that performance on examination may be as satisfactory as is possible.

The element of mastery is not present simply because there has been nothing to master. That individuals survive the process and exhibit in the end evidence of scattered masteries means simply that the driving force of native curiosity has brought about that casual attainment of actual learning which is acquired by any individual in any given round of experience. But such casual and scattered masteries are as little to be taken as evidence of the trained mind as are the ingenious, and perhaps useful, productions of the clever inventor to be taken as evidence that the latter is of the same order of thinker as a Kelvin or a Pasteur.

III

THE PASSING GRADE.—The practice of keeping the mind fixed on lesson performance instead of upon mastery of the clearly defined units of learning leads logically and inevitably to a theory of appraisal and control of pupil progress which is the opposite of mastery. Let us call it the “theory of the passing grade.”

If we set up a given body of content to be absorbed, and fixed time limits within which the absorption process is to take place—and that is what the graded-school system necessarily implies—there can be but one outcome, human nature being what it is. Some pupils will do well, some indifferently, and some will not perform at all. Some will remember much, some little, and some none at all. But at the end of a year or a half-year, pupils must be moved onward to the next grade; or be awarded some other kind of “credit.” Shall we move only those who have remembered all? Manifestly not, for in that case we shall move nobody. Shall we move everybody? Clearly the absurdity would be too palpable. We must then move some and not others, and it will not do to retain so large a proportion that the process itself will come into disrepute. Experience long ago settled the proportion to be moved in terms of popular pressure in the community. If we send on a majority, in a land in which majorities have a peculiar sanctity, the public will believe that the elements of eternal verity are in the school. If we send on an overwhelming majority, the public will think we deal in “landslides,” and landslide is the last word in political certitude. Eighty per cent is a safe majority here, 90 per cent there, and in some communities we dare not trust anything less than 97 or 98 per cent. Hence in A we keep back 20 per cent, and in C we dare not retain more than 2 or 3 per cent. Incidentally, A draws back its skirts and looks askance at the “low standards” of C. X, which is a high-grade private school, massacres 50 per cent and thereby establishes its reputation for “scholarly standards.”

Now, in the process of the daily routine, the teacher cannot help observing that some pupils prepare their lessons well and

some poorly. Can we not grade this daily work and so surround ourselves with the atmosphere of quantitative judgment? Yes, we can let 100 per cent stand for a recitation in which we can find no fault and 0 per cent for one which is nil. Between these extremes, we can let the percentile series stand for all shades of judgment of the quality of the recitation delivered. In a similar manner can we grade the examination. When the day of judgment arrives, we can draw the line at some convenient average percentile grade and in that way distinguish between the just and the intellectually unrepentant and wretched. Where shall the line be? Well, in A we have always been able to escape undue censure if we promote about 80 per cent, and experience shows that about that percentage will usually be at or above 70 per cent on our percentile scale. Therefore let 70 be our "passing grade." In B, however, we find it convenient to promote 90 per cent, and experience shows that 90 per cent of the pupils commonly attain 60 per cent and better. So 60 becomes the passing grade in B.

Thus arises the passing grade as the learning objective, as the true product of learning. Of course, as we easily see upon analysis of the situation, there is no question of any learning product at all. The school is working for performance values on the experience out of which learning is supposed to emerge, and not for learning values. Instead of definitely listing the units to be learned, and guiding and constraining the pupil into a genuine mastery of each as shown by tests focused upon each, and then, if you will, counting the units mastered, the pupil has been required to con and recite upon a certain number of pages, solve a certain number of problems, and translate a certain number of exercises.

In the common parlance of the schoolroom, a pupil is said to do "good work" or "poor work," meaning that he prepares his assignments efficiently and industriously or poorly and negligently, as the case may be. The school is evidently thinking of tasks accomplished and not at all of learning acquired. Indeed, in the study of schoolroom ways, one very often comes upon suggestions of factory ideology, of notions brought over from the field

of industry. In the daily-lesson, textbook school with its whole vocabulary of good work and poor work, acceptable performance and unacceptable performance, passing grades, credits for work done, or perhaps time done, it is hard to escape the conclusion that the picture which is in the mind of teacher, principal, and public is something like this. The textbook with its content, its problems, and its exercises is the job (how that word "job" is getting across the street from the factory and into the school-room!); the pupils are the hands; the teacher is the room fore-

TABLE I

Topic	Pupil A	Pupil B
	%	%
1. Parts of speech	81 Passed	72 Passed
2. Elements of the simple sentence	90 Passed	78 Passed
3. Adjective and adverbial modifiers	50 Failed	71 Passed
4. Phrase modifiers	74 Passed	73 Passed
5. Gender	85 Passed	70 Passed
6. Number	82 Passed	79 Passed
7. Person	94 Passed	76 Passed
8. Case	89 Passed	75 Passed
9. Tense	75 Passed	70 Passed
10. Relative clause	63 Failed	71 Passed
11. Compound sentence	58 Failed	70 Passed
12. Participle	77 Passed	71 Passed
13. Infinitive	42 Failed	72 Passed
14. Transitive and intransitive verbs	56 Failed	70 Passed
Average	73 Passed	73 Passed

man; the principal is the mill superintendent; and so on to board of directors and stockholders. Wages are in the form of grade promotions or credits for work done at or above a passing grade.

LEARNING IS NOT IN PROPORTION TO TASKS ACCOMPLISHED. —But, it may be objected, the pupil learns in proportion to the tasks he accomplishes. We shall presently examine the assumption with the help of factual material, but, before we do that, let us reason together and see if it is at all likely.

Here are what easily might be the records of two pupils on some fourteen topics of grammar, which might, by the way, have been treated as learning units. The two recite for some days on

each topic, performance is scored and an average grade on the series is made possible. The passing grade is 70.

In the first place, have we any evidence whatever of learning? No, we have evidence simply of the average performance value which the teacher assigns to the pupils in each of the fourteen topics. That means, in general, that Pupil A reacted wrongly to nineteen out of one hundred opportunities on the first topic; to ten on the second; to fifty on the third; and so on. Whatever he may have learned, there is certainly no evidence of mastery on any of the topics. We can assume that he had probably made more or less progress on the road to mastery.

But granted that 70 per cent performance is equivalent to acceptable learning, does the average grade of 73 mean that this pupil has acceptably learned in the field covered by the fourteen topics? No, for this involves us in the assumption that by learning Topic 2 very well the pupil must thereby have accumulated enough intellectual surplus to convert Topic 3 from non-learning into learning, and so on down through the list. Patently absurd. Pupil B, steady plodder that he is, performs very poorly on every topic but he passes every one. Now the hypothesis of the school is that a topic is learned when the pupil attains a passing grade—70 in this case. So Pupil B must have learned all the topics of the series. His average grade is the same as that of Pupil A. And yet the latter certainly failed to learn five of the fourteen topics. On the school's own theory, learning values are not proportional to performance values. Indeed, there is nothing more than a casual relationship.

Let us further examine the issue in the light of typical school experience.

Perhaps the most important elementary product of learning in mathematics is the variation relationship. The fourth-grade child encounters it when he ascertains how many eggs can be bought for ten dollars if eggs are seventy cents a dozen. He works many problems of that sort, over a mathematical experience which usually lasts several years. Has he, in the end, generalized

his experience and acquired an attitude to the world of quantities such that he always recognizes the relationship when it exists? In fact, he does acquire the true learning product only casually and in exceptional instances. In the physical sciences, in the practical arts, and in the concerns of everyday life, the common experience is to find large numbers of mentally alert students, who have survived to the latter years of high school and to college, who can utilize this method of thinking only if they are taught anew its specific application to all new material which they encounter. And it is reasonable to expect that, when a pupil has worked over innumerable instances of the application of such a principle, it is only by accident that the principle itself will register, apart from identification of the unit learning and direct teaching, and reteaching if need be, to the point of tested adaptation. There is a vast difference, in the learning situation described, between saying "This pupil has worked seven of every ten exercises correctly" and being able to say "This pupil has definitely caught the central idea."

Another illustration of the same set of phenomena in another field, that of foreign language, German for instance. Here the pupil spends a year, or more commonly three years, in pursuit of a long series of assignments in textbooks, which discourse about the language and present innumerable exercises in illustration of the usages or grammatical principles which are treated. Now, if the teacher were asked to sit down and list the real learning products in view, he would probably enumerate: (1) ability to read the language; (2) possibly ability to speak the language; and (3) comprehension of the language structure. But are these products all the while in the foreground of the teacher's consciousness? Not if the ground-to-be-covered theory is consistently followed. Rather is the performance of the daily exercise the important thing. Day in and day out the pupil satisfies the teacher with his fidelity to the assignment and acquires a high average grade. He succeeds on the examination in proportion as he can recall the details of the immense mass of experience which

he has encountered. Improvement, in reading power let us say, is seldom tested, and, if tested, corrective instruction is rarely undertaken. In the end, have any acquired the learning products for which the curriculum stands? Some have done so, but casually and uneconomically at best. The majority can neither read, speak, nor give any intelligible and illuminating account of language structure. Again, performance has been valued rather than product; learning is conceived as barely acceptable performance.

IV

THE "GET-BY" PERVERSION.—What effect on the pupil's conception of the nature of his learning shall we expect when part-learning is systematically set up as the acceptable standard?

Let us lay aside, for the moment, our objections to performance of the daily task as evidence and assume that such performance is some sort of valid objective. We have seen that the theory compels us to set up a passing grade as a measure of acceptable performance; otherwise the theory itself is impossible in practice. Seventy per cent is such a commonly-accepted passing grade, though any other would serve the purposes of our argument. If letters are used, either the simple alphabetical order from A to E, or descriptive initial letters, the result is much the same, since always the test is acceptable performance rather than perfect performance, which is manifestly impossible, or even adequate performance. Nor can it be urged that 70 per cent stands for mastery and that higher grades stand for additional masteries. The percentage does not represent a count; it is a symbol of the teacher's judgment of the value of performance when 100 per cent represents his valuation of a flawless performance. *The average grade represents no quantity but simply the average of the numbers which stand as symbols of the teacher's judgment.*

As the pupil goes on from grade to grade, from course to course, from credit to credit, he seldom encounters any other attitude in his elders, whether parents or teachers, than that education con-

sists in the partial performance of tasks, in performance up to a level the attainment of which will relieve him from laborious repetition of the servitude. There is no thought of full performance; full performance is the achievement of individuals who believe in works of supererogation. Education is 70-per-cent performance; one goes to school to acquire education; why pursue the car after one has caught it? True, it is gratifying to be rated among those who attain creditable grades, 80 per cent to 90 per cent, let us say, but why be hag-ridden by a vain ambition to surpass one's fellows? Or, if one must, let us set to it and surpass everybody, with an average grade of 97 per cent. Let us note that even very superior performance as thus conceived is not full performance. From the passing grade to the highest grades awarded, partial performance is accepted and sanctioned as valid performance. Now, even granted that performance is translatable into learning, mastery can certainly not arise out of partial performance. The whole theory, therefore, of necessity eventuates in building up in the developing pupil the conviction that performance is achievement, that very inferior work is acceptable work, and that the most superior performance is still less than full performance.

Study of problem cases, in the laboratory schools especially but elsewhere as well, seems to show in many pupils a characteristic well-defined volitional perversion which we have come to call the "get-by attitude." The pupil thus afflicted—and the victims are many—comes to see any task which he has to do, not as a thing to be accomplished in a finished manner as a matter of course, but rather as an undertaking upon which he will economize effort to the degree which experience has taught him will be accepted. If we raise the standard by requiring a higher passing grade for certain purposes, we simply require greater exertion without changing the attitude. As the pupil goes on into high school and college, he often becomes very skilful in his ability to just scrape through. What college teacher has not met these people? They occasionally become solicitous about grades and upon being as-

sured that their work is acceptable, receiving B perhaps when the passing grade is C, they at once relax.

Now, the teacher, and perhaps the parent, passes this all off with a good-natured smile and the comfortable verdict "Just a boy—he will come out all right." Yes, it is just a boy—a nine- or ten-year-old boy. This grown-up boy has coined an expressive phrase with which he estimates the lowest passing grade in life. The phrase is, "You can *get by* with murder in that bunch." The truth of the matter is that the attitude when found in high school or college is a serious perversion and, unless corrected, results in permanent volitional retardation. The attitude carried over into adult life means irresponsibility, low standards, and, whenever the social controls become relaxed, lawlessness in a variety of social relations. Such an adult is incapable of becoming a citizen, in the social sense of the term, albeit he may legally be capable of voting and holding office.

The educational determinist meets us with the rejoinder, "This is the kind of persons such people are—they were born that way and that is the whole of it." Again not so. The perversion being identified, the teacher can set up the appropriate learning unit and teach the pupil out of his perversion in much the same way in which he would teach a principle of economics or a drama. Only the remedial work will be done in the presence of heavy odds, if the school still insists on a theory of administrative technique which is as well calculated as possible to develop continuously the perversion anew.

V

PERVERSION OF LEARNING ATTITUDE.—It is far from true that all pupils in schools whose teaching is founded on the belief that lesson performance is translatable into learning are afflicted with the specific volitional perversion which has thus been described. Under the stimulus of ambition or emulation or because a chance interest has been wafted in their direction, a great many, the majority we hope, do achieve a genuinely good standard of per-

formance. Some of them out of performance acquire the true learnings intended. Nevertheless, a great many do pass on into higher classes and other institutions with a curious lack of sense of the reality of learning, attributable without much reasonable doubt to the performance conceptions to which they have all their lives been accustomed.

A student is called into conference by the author to discuss the former's shortcomings in the use of his mother-tongue in written papers. After the customary introductory remarks, conversation something like the following takes place:

"But, Professor, I have always had good marks in English in high school and college."

"Yes, but let us look at this sentence. Just what do you mean?"

"Well, I suppose I mean—"

"Is that what you say?"

"I will get my English grades from the recorder's office and bring them to you."

Happy thought; that will adjust the whole matter!

Now, the student is mentally capable and there is fundamentally no reason why he should not become a well-equipped man, but just now he and I are hardly talking the same language. To him formal education is purely a matter of his precious grades. He has not the remotest idea that they stand for valid reality in terms of any intellectual activity of his own. In time we get together and he comes to take a genuine pleasure in recording his reasoning in respectable discourse. The picture is composite; it is not an extreme case but typical. I have no doubt that the experience in one form or another can be duplicated over and over again by many if not most of my readers. It represents a fairly normal end result of performance schooling.

What of the multitudes of youngsters who stray from the pathway of schooling long before they have reached university level? Is it at all likely that they have taken on the adjustments in attitude to the modern world which is education, unless they have

done so by chance? What of the alleged submerged intelligence of the 80 per cent of our population? Is it nature or the failure of nurture?

And so we return to mastery of the true learning products. In the list of grammar topics on page 44 we have a series of possible unit learnings. The list evidently does not cover all the learnings in this field which are needed in order that the structure of his discourse may be comprehensible to the graduate of the secondary school; but even so it goes far. Such as it is, however, the list can be viewed strictly as one of identified, significant units of learning. Teaching which is intent upon actual learning will then present each unit in succession and persevere in its effort until the pupil has indubitably caught the meaning and sense of the unit and manifests his mastery through his reaction to searching tests calculated to settle the issue whether he has learned or has not learned. Such teaching is not satisfied to grade the pupil 70 and pass on, for it realizes that three failures out of ten on valid test items means that the pupil is only on his way to mastery and has not yet arrived.

Thus the contrast between direct teaching and lesson-hearing.

CHAPTER IV

THE PRODUCT OF LESSON-LEARNING

FROM time immemorial people have supported schools and distrusted their product. The man of affairs distrusts book-learning. The successful practitioner of a profession sometimes refers contemptuously to the textbooks of his calling. Few people have full confidence in him whose life is a lesson learned. Schools are caricatured and the schoolmaster patronized. And yet schools are carried on and extended in a manner which can leave little doubt of the conviction of modern peoples that the School is one of the vital institutions of civilized society. Why this appearance of puzzle-headedness, this apparent faith in schools and distrust of their product?

Most professional students of the educative process in our own time and in past ages have in effect recognized the anomaly and have sought to divert the school's attention from bookishness to learning. In the comparative success of their efforts lies most of the progress of the modern period. In large measure, the school practices which we have discussed and criticized at some length in the preceding chapter probably account for the discrepancy between schooling and education. In the present chapter, we shall study the concrete outcome of that teaching procedure which seems to be chiefly responsible.

I

A SPECIAL CASE UNDER PERFORMANCE.—The procedure referred to is the theory of teaching which we have perhaps sufficiently described as lesson-learning and lesson-testing. We have discussed its relation to the mastery idea. Probably none of its thoughtful practitioners would admit that they are in principle unregardful of the real learning which is assumed to be associated with lesson-learning. They must, however, rest their case on the

assumption that lesson-learning automatically transfers to the real learning for which it stands. We shall consider some evidence tending to show that it does so in practice only casually and uncertainly.

EXPERIMENTAL EVIDENCE.—In 1920, the author undertook to investigate the relation of success in daily recitation to actual achievement in certain courses. At that time, the technique of the teaching investigated was far from being an extreme form of lesson-hearing. The content of the daily lesson was illuminated by direct teaching in various ways. The classes were small, and the teacher had large opportunity for corrective work with the individual pupil. Nevertheless, the atmosphere was that which is always created by the assignment of the daily task and evaluation of the student's average performance rather than his attainment of the understandings, or appreciations, or abilities, presumably contemplated by the teaching. The results of the investigation were originally presented in the *School Review* for January, 1921, Volume XXIX, pages 19 ff. They were reprinted with additions in the first edition of the present work. The exhibit of factual material is somewhat elaborate and it is thought to be unnecessary to do more than recapitulate and explain the findings in the present edition.

LATIN.—The initial study was applied to four classes in Latin. Similar investigations were subsequently made in other classroom subjects and in other schools. In general, the method was to compare the ranking of pupils in the application of the true learning product with their ranking on lesson-performance.

For example, in the Latin study a sight translation was set which was presumably calculated to yield evidence of progress on the way to ability to interpret the thought of the printed page. The discourse was then broken up into thought-units, the correct reactions counted, and the class was distributed in accordance with rights noted from highest to lowest. Next, the test material itself was assigned as a lesson to be conned in the ordinary fashion, the right reactions on the lesson-learned material were noted

the next day, and the class distributed as before. Of course, the scores for the second day would tend to run higher than for the first day, but on the assumption that lesson-learning results in true learning the rank in class ought to be approximately the same on the two days. But nothing of the sort happened. The results showed a picture somewhat according to the following description.

In the four classes studied, approximately 25 per cent did relatively as well on the first day as on the second. Some of these did very well indeed on both days and some did poorly on both days, but the evidence in the case of the latter tended to show that whatever they had learned was true learning.

On the other hand, in the cases of 40 per cent there was wide discrepancy between what they could deliver on a sight test and what they could do when they had opportunity to prepare. Thirty-five per cent were at various stages between the two extremes.

The classroom procedure was then altered. In place of lessons assigned, the class period in one of the four courses originally studied was taken wholly for practice in sight reading. Two years elapsed and a similar study was then made. The pupils at the two periods were not the same, but both groups were composed of the typical constituency of the Latin curriculum in this particular school. The teachers were not the same, but they were on a par in terms of their ability to hold class attention as measured by group-attention scores. (See Part II.) Such difference as there was is in favor of the first teacher. The outstanding and conspicuous variable was the theory of teaching applied.

On the original testing, 10 per cent of the pupils, for the equivalent material and course used in the two tests, were clearly true learners. In the later test, 39 per cent fell in this group. On the original test, 40 per cent fell within the conspicuous lesson-learning group, while in the later test none could be so identified. On the sight test in the original run, the median pupil scored 39. In the later test, the median pupil scored 87. Evidently the use of a

teaching procedure calculated to develop the true learning product, in the place of a procedure based on the assumption that lesson-learning will transfer to true learning, had gone far.

EVIDENCE FROM SEMESTER GRADES.—In connection with the laboratory investigation which has just been described, scores on an achievement translation test in French, of the same type as that used in Latin, were compared with semester grades in the same course. The semester grades were the average of the teacher's estimates of daily performance, heavily weighted, in combination with the scores of performance on a semester examination. Thus, the semester grades at that time represented the school's appraisal of the value of the pupil's learning as inferred from day-to-day performance, while the test scores on the sight test are some index of their progress toward attainment of the true learning product.

The investigation disclosed that the school had probably been putting a roughly correct appraisal on the learning of 40 per cent of the class. Thus far the disclosure was apparently much better than in the case of Latin, but then the teaching procedure in French had been consciously and of intention direct teaching, despite the fact that appraisal was in terms of daily performance. On the other hand, the school had been putting a grossly wrong interpretation on the learning of 25 per cent of the pupils. Of the latter, two who exhibited acceptable evidence of actual learning were barely achieving the passing grade of 65. One pupil who showed evidence of a high grade of actual learning, that is, of a high level of approach to the reading adaptation, was unable to satisfy the teacher that his learning was more than mediocre. Three pupils who were being "honored" by the school presented evidence of only the vaguest sort of partial learning.

It may be objected that the comparison thus instituted ignores the fact that there was much grammar represented in the semester grades. Whether or not a test which would have compared learning in grammar with lesson-performance in grammar would have shown essentially different results we leave to the reader's

judgment. The issue, however, is immaterial. The true learning product here is ability to read French. If grammar helps toward the attainment of that ability, well and good. We are testing ability to read, not erudition which may or may not have contributed to the learning.

IN OTHER SUBJECTS AND SCHOOLS.—Since the study which has thus been described was made, I have been curious to find out in factual terms whether similar effects could be found in other schools and in other subjects. With the help of my students, I have been able to collect a considerable variety of similar material, in foreign language, mathematics, science, and spelling in the elementary school. Sometimes the tests applied have been of the type suggested here. Sometimes, in both science and mathematics, the procedure has been to compare performance on exercise material with performance on the interpretation of simple situations to which the exercises were supposed to apply. In a somewhat extended spelling study, comparison was drawn between performance on spelling lessons and performance with the same words used in free written papers. Always the same sort of result appears. In one study, the number of pupils showing high transfer from lesson-learning to the thing to be learned was as high as 50 per cent of the group tested. In most studies the number of high transfer cases ran from perhaps 15 per cent to 25 per cent of the groups. In every study there appeared a corresponding percentage of very low scores on the learning test united with very high scores on the lesson test. The differences shown in the study touching the percentage of high transfer are probably in the main due to differences in the teaching. Some teaching had a large element of direct teaching of the unit learnings themselves, while other teaching depended upon lesson-hearing to a relatively greater degree.

We might go on and fill this volume with evidence of this sort. We have gone far enough to show that our analysis of the reasonable expectations of the outcome of the daily lesson, ground-to-be-covered, time-to-be-spent theory, is borne out by a substan-

tial body of fact. The author apprehends little doubt in the mind of the reader that indefinite exploration of the results of the teaching theory which is under criticism would lead to essentially the same induction which comes out of the limited body of factual material which we have exhibited. We can see the principles which are at work. It is important to contemplate now those principles from the point of view set up by this chapter.

II

THREE TYPES OF PUPILS.—There seem to be three somewhat differentiated pupil-learning types revealed by the study, and the differentiation which we here suggest seems to be borne out by our unreported laboratory case studies. The practicing teacher will, we think, have little difficulty in verifying the types.

The first of these is the type which does well on daily performance, and in the process attains some real learning. Let us designate these pupils the “transfer type.” As a class, they are adaptable individuals who can conform to almost any sort of constraint. They are conspicuously dutiful. They are often successful in after-life, in spite of the popular tradition that class leaders do not succeed in practical situations. They are the individuals to whom the school points with pride, and likely enough they are the chief justification of the determinist writers who conclude that only a small percentage of humanity is really educable. They are the ones who justify the position taken in this volume that out of the formalistic practice of teaching only a few individuals actually learn, and these only casually and unsystematically. It should be observed that pupils who belong to this type do not necessarily stand high either in performance or in learning. They sometimes learn lessons poorly but what they learn appears as some part of a true learning product.

The contrasting type is a group of pupils who attain a wholly negligible amount of real learning but are able to make a very creditable daily performance. Let us designate them the “lesson-learner type.” They frequently show marked ability in perform-

ance and consequently are quite as likely to be among those who receive the highest approbation of the school as are individuals who belong to the transfer type. They are doubtless the ones who have justified the tradition that class leaders do not succeed in after-life, for the world's demand is for the real learning products and not for lesson-learning.

The third group is composed of those who accomplish little or nothing in the daily-lesson performance but who sometimes surprise us by the extent of their real learning. We can only conjecture what the learning situation is with these people. They are frequently catalogued by the teacher as either mental defectives or as ne'er-do-wells of some sort. They assuredly never belong to the first category, for the definition of mental defect excludes them. To the second? Very likely in some cases. But there are others. We not infrequently encounter a pupil in school or an adult in after-life of whom we say, "You cannot tell this person anything; he has to learn from experience." To some pupils the daily lesson apparently means little or nothing. It is not only unintelligible but irksome. They can learn but they either cannot or will not learn that way. Let us call them tentatively "direct learners" to distinguish them from the other two types. Occasionally an individual has the trait to such a degree that it has the appearance of a veritable malady. Two extreme cases are cited in illustration; others might be added.

A certain problem case has exhibited the most eccentric combination of indubitably superior learning and of performance which sometimes seems like that of a moron. At times he apparently cannot read at all, and at others he reads successfully rather difficult scientific material. He has been measured, diagnosed, corrected, remedied—all with apparently little effect. Asked to write a composition on a set subject, he turns in a mass of gibberish. At almost the same time, asked to describe in writing an occurrence which he has already graphically described in words, he turns in a composition fully up to his grade level. The "I.Q." is somewhat above normal. The pupil is healthy and is

normal in his social reactions. He is perhaps simply an extreme type of the direct learner. He apparently lives so close to the world of reality that he not only resents the artificial school exercise but can find no meaning in it whatsoever. The school exercise probably means as little to the expert lesson-learner as to him, but the lesson-learner can adjust himself with entire readiness to this artificial thing—he requires no meaning—but our pupil cannot so adjust himself. In a school in which direct teaching has become almost universal this particular pupil has ceased to be a problem.

The second case is that of a pedagogical problem pupil who has had time to come to full maturity and demonstrate success in life. In the high school, this pupil was practically a non-learner under the daily-lesson procedure. He came to be four years retarded and left school. He was suspected of being “somewhat lacking,” but a less cocksure period diagnosed him conservatively as “unable to learn from books.” And yet he has lived a conspicuously successful life in the very lines in which the high school was supposed to contribute. An utter failure in the school sciences, he became an inventor of mechanical devices of the highest order. Hopelessly inept in the algebra and geometry of the schoolroom, he came to spend his days in the realm of higher mathematics. Like the first case, his was apparently an instance of the extreme direct-learner type, so extreme that he could learn nothing at all from lessons. The long list of eminent men who were once school failures, cited by Swift in *Mind in the Making*, may, some of them, very well have been of this type.

Can we doubt that the majority of pupils who learn only vaguely and uncertainly from the daily lesson are instances of the direct-learning type at various stages of docility? Can we doubt that both the transfer-type pupils and the lesson-learners are direct learners who are possessed of maximum docility and who adapt themselves, in the one instance well but uneconomically, and in the other perversely?

It is not unreasonable to suppose that the direct-learner type

is the chief contributor to those school failures who succeed well in after-life and whose success is viewed by the public as a reproach to the school.

TYPES NOT DETERMINATE IN CHARACTER.—Since the first edition of this work was published, I have noted a strong tendency among school people to seize upon these types as explaining more than they do explain. Particularly are those who are indoctrinated in the current educational psychology inclined to divide society in terms of “transfer types,” “lesson-learners,” and “direct learners” as innate characters. Not so. There is probably nothing innate about the matter, save possibly as temperamental differences tilt the tendency one way or another. On the contrary, normal and economical learning is that which the “direct learner” pursues. The “transfer” pupils have learned to learn in an uneconomical fashion. The “lesson-learners” are probably cases of sheer perversion, that is to say, they have taken on a perverted development of personality. In this connection there ought to be noted and condemned the attitude of those fatalistic teachers or non-teachers who, having learned a new term, dismiss these people with the contemptuous verdict “Oh, just a lesson-learner!” The lesson-learner is commonly what the school has allowed the pupil to become and he is a pedagogical problem to be corrected.

Learning represents effort and for that reason always encounters what may be called adaptive inertia. There is in human nature a tendency, well recognized in psychopathology, to try to escape from reality through illusory compensation. It is easier to con lessons than to learn. Hence, lesson-learners in various stages of the malady readily develop in a school which not only affords the opportunity but actually puts a premium on the process.

What is to be done about it? In the main, this whole volume is an attempt to answer the question in terms of the specific procedure called for. Let us generalize our answer in the precept, abandon the lesson-learning and lesson-hearing theory of teaching, with its implications of ground-to-be-covered and passing

grades, and substitute therefor the direct teaching of the real learning products, with tests applied to the identification of specific adaptations in the pupil and used primarily as bases of correction in pedagogical treatment rather than as bases of crediting the pupil with performance accomplished. From time to time, any teacher in any subject can devise tests of achievement, and, by comparing the results with those obtained from the use of the same test material as a lesson, can detect the lesson-learners and apply corrective treatment.

III

AN EDUCATIONAL MALADY.—The lesson-learning attitude once established in pupils becomes one of the most baffling of all the elements of problem case work in later years. It is often so definite and characteristic that if we nickname it the "what-do-I-do-next attitude" or the "that's-what-it-says-in-the-book attitude," we shall not go far wrong. It appears in those who must work under direction when the operator returns to his supervisor with the verdict, "I have done just what you told me and it does not work," never dreaming that directions or suggestions can seldom be anything more than helps which enable a human personality to react successfully upon his own task. It appears in teachers who are preoccupied with devices and whose notion of a methods treatise is that the latter should be a sort of pedagogical cook book. Its prevalence in the world is indicated by the highly profitable returns from "fool-proof" devices.

We cannot bring this chapter to a close without venturing a suggestion of what lesson-learning may have meant to the social controls. We see plainly that perhaps the majority have probably never acquired more than the vague beginnings of learning, not enough to modify in any important way either their attitudes toward the world or their behavior in society. A formidable proportion have acquired only the sheerest of pretensions. It is only too obvious that multitudes about us pursue lives which are tolerable only because social institutions hold them in restraint. At

times, economic revolutions, or catastrophes such as the American Civil War or the War of 1914-18, relax the social controls. Large numbers of people then revert to the control of their actual instead of their spurious adaptations. Orgies of corruption, license, and perhaps crime, become serious social phenomena. Writing of an older social life, a pagan poet and the greatest of the apostles alike gave expression to a tragic thought. We see the better course and acknowledge that it is the better; we follow the worse. In other words, our vision of right and truth is but a lesson learned. It is difficult to be too confident of the regenerative power of the School in the complex of human affairs, if only the schoolmaster can learn to identify and impart the true learning products, in the place of the daily routine of lessons conned and performance scored.

CHAPTER V

APPRAISAL OF PUPIL PROGRESS

WE HAVE in the preceding chapters distinguished between the real learning products and the procedure which is assumed to generate those products. We have used the term "mastery" to define the actual acquisition of the learning products by the pupil. We have surveyed, both on theoretical and on factual grounds, the outcome of the lesson-learning process in terms of real learning. We have seen that the assumption that the educative process is a matter of graduated stages, of ground-to-be-covered, and of performance to be measured leads logically and inevitably to methods of evaluating pupil progress in which only casual account is taken of the legitimate products of learning, and in which education is and must be constantly confused with performance. We now invite the reader, first, to a further critical study of formalism in its relations to the school's appraisal of the pupil's progress in his educational development and to the pupil's understanding of the nature of his own education; and, second, to a constructive analysis of a more valid appraisal in terms of real learning.

I

APPRAISAL BY TIME SPENT.—The whole body of administrative stereotypes which, as we have seen in chapter i, had its origin chiefly in uncritical acceptance of the three historically fundamental schools, led by natural evolutionary process to the evaluation of pupil progress in terms of the years which were assumed to belong to the three schools after they had become adjusted to one another in a serial relation—first elementary, then high school, then college.

The eight grades or years of the elementary school seem to

have furnished a convenient starting-point. A child is assumed to have acquired an elementary education when he has succeeded in attaining a passing grade on performance for eight successive years.

In the early nineties of the last century, the need of defining a high school became apparent. Hitherto, pretty much anything had been a high school which chose to call itself such. The author has encountered schools which were denominated high schools on the naïve ground that they were domiciled in the second stories of buildings. Conversely, he has been officially advised by a state's chief law officer that no school could be recognized as a high school within the meaning of ancient statutes, still unrepealed, unless it taught Latin and Greek. Manifestly, the need of definitions had become acute. Now reputable high schools and academies had very generally required four years of study prior to the award of the school's diploma. Here would seem to be a sufficient ground of reckoning. Why not have four years in the standard high school on top of the eight years of the elementary school? The solution did not turn out to be so simple. Apart from some sentimental reasons, there was the practical administrative plague of the elective system. How can you define a school as consisting of four years and nothing more, if not all pupils pursue the same pathway through the school? Manifestly some method of establishing equivalency of performance requirements satisfied must be found, if you were going to adhere to the performance standard at all. Hence there was evolved a system of course-units, such a course-unit being defined to be a single subject pursued for a year, and sometimes called a Carnegie unit. Largely by process of agreement in conference, the high school was standardized at approximately fifteen such, not because there was any special virtue in fifteen or sixteen as compared with ten or twenty or thirty, but rather because fifteen represented the comfortable fit to four years. It is worth remembering that one of the most effective influences in establishing this kind of a definition of high school was the need of some method of defining a college

which could qualify under the original Carnegie professorial pension plan. Colleges then began to plan their admission requirements in terms of course-units, but not all colleges required the same number.

The history of this stage in our institutional evolution in itself furnishes considerable evidence that performance of tasks was the central consideration and indeed that the whole process of education was viewed as analogous to industrial production. For instance, many colleges for a long time refused to evaluate all course-units as mutually equivalent. The logic of the situation was performance and not learning. That being the case, it was evident that some pupils would pursue the path of dalliance through a sequence of courses none of which required undue exertion, while the dutiful and the ambitious would follow the more arduous pathways. In the end, the diploma would not mean the same thing or even equivalent things for any two students. Hence, an elaborate system of weights was set up. In substance, the applicant for admission to college was told, "If you took this course in high school which is only half as 'hard' as that, then you must supplement the course which you elected in high school with another or others, in order that your total performance may be on a parity with that of your fellow who took the 'hard' course."

It is unnecessary to trace the process through the college. It was in all essentials the same as that which took place in the high school. There was nothing in the situation to prevent the college using the course-unit plan of appraisal just as the high school was doing. Instead, however, a similar but more intricate machinery was set up and semester-hours or student-majors became the numerical system employed. The semester-hour is self-defined. The student-major in the quarter system is a single course pursued for a quarter or approximately three months. The college, with entire consistency, blocked up as many easy pathways as it could, just as many colleges had refused to accept fifteen high-school course-units at face value. The student must perform ac-

ceptably if he were to stay in college. He must perform at a higher degree of acceptability if he were to receive the Bachelor's degree. Hence, course sequences were worked out and grade points, of one sort or another, were superimposed upon the course grades. In the end, a student is entitled to the college degree when he has performed acceptably to the extent of eight grades, plus fifteen high-school course-units, plus approximately one hundred and twenty semester-hours or thirty-six majors. Hence the educational currency dear to the heart of the registrar. That the term "currency" is not inaptly chosen can be seen by anybody who cares to sit down with the average high-school or college student, as the day of liquidation approaches, and contemplate the process of balancing the books.

II

EDUCATIONAL IMPLICATIONS.—Now, assuming for the sake of argument that every one of the thirty or more teachers whom the student must have encountered has been efficient and conscientious and vigilant—and that is more than we have any right to expect under any form of procedure—is there any likelihood that he will have acquired any of the real learning products contemplated by his various courses? The preceding chapter is a sufficient answer to the question. Is there any likelihood that he has been educated? There is no evidence that any theory of education, valid or non-valid, has been in control of the process. At the end, we have evidence that he has performed the set tasks acceptably, but no evidence whatsoever that the tasks have operated to modify in definite and significant ways the individual's adjustment to his environment. We might expect that the student would leave school or college possessed of the idea that "schooling" and "education" are synonymous terms and that he would carry with him such a conception and contribute the same to the popular understanding of the nature of education. There is ample evidence to be found in any higher institution, whether high school or college, that such is indeed the view prevailingly held by that

portion of the student body which gives any thought at all to the ultimate meaning of the school experience. The view is well illustrated by the reaction of a certain student to a college course in English literature. This young man had done his work in the course very well indeed, and was congratulated by an older friend, who expressed the expectation that the course in question would shape the reading of a lifetime. "Well," rejoined the youth, "it is over with anyway. I have the credit, and, thank Heaven, I shall never have it to do again!" Again and again, do we have occasion to contemplate the following situation. A group of students is comparing notes with reference to their progress in a course or through an institution. This one has recently received a B, and he announces that he can now "rest up" since the grade assigned assures him an average grade of C and C is all he needs in order to receive "credit" for the course. Another has a worried look over his B for that puts him in jeopardy with reference to the "honors" which he covets. Seldom is the student found who dreams of education as a process of growth within himself, of which none can deprive him and for which he needs no "honor grades."

The actual educational situation is not infrequently reflected in the student code of ethics. In spite of the impending vengeance of the authorities, and in spite of the honor system, cribbing and similar unethical performances go on. The offense is at the worst venial, *malum prohibitum* but not *malum in se*. Like the rest of us, the student is a good citizen in so far as he is inwardly convinced of the sinful nature of certain acts. For other acts, his citizenship is strictly in proportion to the vigilance and efficiency of the police force. In the school, he is surrounded by unreality. All these marks and grades and credits are devices by which the faculty constrains him in a pathway which he travels only for the sake of a valuable unreality, namely, a high-school diploma or a college degree. If he can outwit the faculty, it logically follows that he is efficient. If he is caught, why, he will "take his medi-

cine" like the good sport he is. There is nothing in it which affects his personality wherein honor resides.

CURRICULUM IMPLICATIONS.—So much for the theory of appraisal itself and its immediate educational implications. The theory once accepted and followed inevitably leads to certain conclusions touching the matter of content of the individual pupil's schooling. If we once accept premises which of necessity imply evaluation in terms of performance rather than in terms of learnings attained, and which imply appraisal of performance in terms of a count of credits, we are led to minimize the importance of what a pupil shall learn. If we add to this theory of appraisal the determination of curriculum policy by the political weight of the several groups in the faculty and in the constituency, we arrive at a result which is perhaps as far as possible from a scientific adjustment of the content of the schooling to the requirements of any valid theory of education. In practice, accordingly, it often happens that the program of a given student during four years of high school is a weird mixture, almost wholly unrelated to the fundamental learning products which must form the groundwork of any successful adjustment of the individual to the world in which he must live. A common pupil program for four years of high school is: four course-units of lesson-learning English; four course-units of Latin; three course-units of mathematics; three course-units of one modern foreign language and two of another. Such a program is common but not typical. It is typical for students destined to a certain influential kind of undergraduate college and originating in families whose own school tradition is of that sort. Even for the transfer type of student whom we have identified in the preceding chapter, there are at best not more than two or three units of the fundamental learning products which stand for adjustment to environment and these are all English literature. There are three course-units of abstract thinking, of little consequence apart from application in the sciences. The remainder is made up of tool subjects entirely. Admittedly, this is an extreme case, amply to be verified, how-

ever, out of the catalogues of various colleges. Probably the most typical program would be one which substitutes for the four course-units of Latin and for one course-unit of English in the preceding, two units of science, two of history, and a single unit chosen from a field of possibilities—household arts, mechanical drawing, mechanical arts, economics, civics, and possibly some of the commercial subjects. So completely is the vital matter of content overlooked, in adherence to a lesson-performance theory of teaching and of education, that a student may readily pass through high school and subsequently through college with little or no training in those subjects which alone can provide him with an intelligent outlook on life. If the press occasionally furnishes us with an outbreak in which the incredibly ignorant spots in the intellectual equipment of the college graduate are exhibited, need we wonder?

PROGRAM IMPLICATIONS.—Perhaps the most serious import of appraisal in terms of credit for time spent at a standard performance level is in its effect upon the organization of the program of studies as contrasted with curriculum content. Whenever the issue of more effective teaching is raised, as it eventually is raised, the most common single reaction is, But we must get this into a single semester or a single year. Hence the administrator's grand tactics come to be the formulation of programs in terms of what the average pupil can learn in the allotted time. But the learning process refuses to be constrained in any such artificial fashion. Water will not run up hill merely because we sometimes wish it would do so. A given series of essential learnings is not necessarily acquired in a given restricted time merely because such would be administratively convenient. The constant is the learning; the variable is the time required. The emergence of the adaptations in personality which constitute education, and which severally are the objectives of teaching, is a lengthy growth process; and this is especially true of the fundamental adjustments found in the acquired intelligences and value attitudes discussed in chapter vi.

It is no doubt true that the full period of schooling must be carried out within the years during which young people are growing to physical maturity, and there is much to be learned, but that properly implies the reduction of the program of studies to the learnings which are essential in the fundamental structure of the civilized personality and which govern the great mass of learnings which every individual acquires independently of schooling.

Hence the appropriate groundwork of program organization is the identification of these essential learnings, the assignment to each of whatever time may be required by the learning process, and the elimination of waste through systematic teaching procedure.

III

APPRAISAL BY RANK IN CLASS.—Out of premises in which credit for performance over a period of time is accepted as criterion of the educational growth of the pupil arises a further aspect of appraisal which has important implications. It may be denominated "rank-in-class." The theory that the passing grade is translatable into an acceptable evaluation of learning leads us into difficulties, for we have in that case no measure other than the teacher's judgment of performance. What is acceptable performance and therefore entitled to the passing grade? If we are judging mastery of a unit of learning, we have an absolute standard and we can examine evidence touching the issue whether the pupil has the unit or has it not. We may be mistaken in our judgment, but we are at least judging in terms of a fixed basis. Not so with performance judging; our only basis there is comparison of one pupil's performance with that of another. It ceases to be a question of whether John and James have both learned, but rather a question of which of the twain has learned the better, or rather which has performed the better. In the end, the pupil body is thus distributed in terms of relative merit of performance; one end of the scale is honored and the other is cast into the pit. The principle is overlooked that we have not a shred of evidence that either end of the class has learned at all.

Thus arises the stereotype of rank-in-class and the doctrine that a pupil's education is to be judged, not by his actual development, but by comparison of his deeds with those of his fellows. Thus arises, too, the self-glorification of fond parents over the competitive qualities of their offspring and the bitter disappointment of others, not in their son's failure to grow, but in his failure to surpass the neighbor's son. Thus arises the popular conception of the highly educated man as the victor in a cultural jungle.

EFFECT OF APPRAISAL BY RANK.—The compensatory mechanism is a commonplace of modern social psychology, and appraisal by rank is one of its common outlets. The individual who is not sure of himself seeks peace by asserting his superiority to somebody else. They who have not found themselves are unhappy until they have established the outward symptoms of complete superiority in their own social group or small town. Hence they build pretentious houses, adorn themselves with costly garments, and buy one more automobile than anybody else owns. The meat of the matter for our purposes is that rank is a crude method of appraising the individual's social status. If an educational institution awards and sanctions rank, no matter how laudable its intentions may be, it simply creates the situation which is appropriate to rank. The student body rapidly takes on the characteristics which can be measured in that way alone. Educational products themselves are lost to view. The evidence is illustrated by the following.

A very common occurrence in school is a colloquy between a typical mark-getter and rank-chaser and a pupil who has acquired a genuine intellectual interest. The first contemplates the pursuits of the second with uncomprehending amazement. "Why do you do it?" he asks. "Oh," replies the second, "I am just interested, that is all." "But," carefully explains the other, "don't you understand that you will get no credit for it, it will get you nowhere?" The second has acquired a real educational product, the first has acquired nothing but a facility in outstripping some of his fellows in a scheme which the school itself has set up.

Appraisal by rank-in-class is therefore badly calculated to identify and measure the real educational product. Worse than that, it seems to have an essentially anti-educational tendency. Most of the envy, hatred, and malice of life, and much of the unhappiness, arise out of the primitive inclination of men and women to compare one another in terms of social status. And yet the appraisal by rank which the school often sets up in its classroom must, in the nature of things, furnish the very seed ground for the growth of these fundamental social vices. In the place of inward satisfaction in growth attained, of which the individual can be certain, it substitutes the restless ambition to surpass one's fellows. If the pupil succeeds, he has acquired only a false outlook on life. If he fails, and all but one must fail of complete satisfaction, his dissatisfaction is only too apt to discharge itself in envy, suspicion, and ungenerous hatred. True, we can possibly secure the semblance of contentment by setting up as an ideal what may be called "educational sportsmanship." But we shall be likely to succeed only in establishing a repressed discontent which will break out later in antisocial attitudes and very possibly in abnormal behavior. We cannot build a democracy, not to say a Christian civilization, on such an educational foundation.

•

IV

A VALID METHOD.—We now turn to the other aspect of our problem and seek to analyze the foundations of a valid method of appraising the progress of the pupil's educational development.

We recall our discussion of the learning units and their manifestation in the pupil as genuine adaptations, as elements in his whole outlook on life and in his conduct. Any appropriate method of appraising pupil progress must then rest on a *count of the true learning products* which the pupil has attained and in which his mastery has been verified by the best evidential means at our command.

Such being the issue, we must evidently turn to a method of

identifying mastery of any one learning and on that point we must beg the reader's indulgence. No one method will suffice; we shall need to work out testing procedure in each of the several types of teaching which we shall encounter. Nevertheless, the problem before us is to *identify the presence of learning as a quality* and not to *measure performance as a magnitude*, although few things are more certain than the entire possibility of measuring performance in some cases with a high degree of confidence in the reliability of the result.

"NEW TYPE" TESTS.—During the recent period of absorption in biometrics, we have all become very familiar with efforts to "measure educational results." The notion that everything whatever can be measured being swallowed without examination in one gulp by people to whom "objectivity" is a fascinating new word, tests which purport to "measure" are produced in bewildering array. That the measuring movement has represented a step in advance there can be no reasonable doubt, but the advance has been over the so-called "old type examination" in the interest of greater precision and reliability. Be it noted, however, that the old examination was in essence itself an attempt to measure performance and not an attempt to secure evidence of the presence of learning.

As we have seen, performance is in the nature of quantity and as such it possesses a series of magnitudes extending from zero indefinitely upward, decreasing progressively beyond the point of diminishing returns.¹ It has magnitude value long before anybody could possibly claim that any learning has taken place. Consequently, no given score can tell us whether learning is present or not. The scale may be in algebra and focused on the notion of the equation. A given pupil may show a series of ascending scores on successive applications of the test up to the score which is deemed to be satisfactory. What evidence is there that the notion has registered and that the pupil in fact can be said to know the equation? Note, further, that in science-type subjects such

¹ See Fig. 1, p. 39.

scales seldom focus on definite learnings at all. They are rather applied to algebra or arithmetic, physics or biology, history or economics in general. Again, the scale may have been designed to "measure learning" in a foreign language. It is properly standardized and its reliability established. But what evidence does a given score yield that the pupil can read?

Now when physical or medical science has occasion to identify the presence of qualitative changes or conditions and wishes to use measurement for the purpose, it establishes critical values, on one side of which the quality is present while on the other side it is not present. For example, fever is a qualitative condition of the bodily organism. As such, it is primarily identifiable by its signs or symptoms. But one of those symptoms is a rise in temperature and 98.3° is found to be the critical point. At 100° fever is present; so is it at 103° , and the latter quantity means that the organism is more extensively involved in fever. The temperature reading is the readiest and most reliable symptom accessible to observation, but temperature is not fever, or whatever other clinical term the medical man employs to define the condition.

If students of the teaching process can positively identify the qualitative accretion to personality which we call a learning product, devise an appropriate performance scale, and identify the critical score, or range of scores, then and not until then will standardized measurements have any real value as means of certifying the presence of learning. I have made some attempt to achieve such a result in the case of eye movements as evidence of the presence of the reading adaptation in foreign language. The method is explained in chapter xxiv.

On the whole, however, attempts at scientific appraisal of the learning products which follow the precedents of physical science are likely to be doomed to failure, at least for a long time to come. Whatever evidence we can get must be in the conscious responses of the pupil. Hence the convincing analogy of valid testing is that of the procedure of the competent and truth-seeking attorney in the examination of a witness. To illustrate:

A witness avers that he was an eye-witness of a crime committed in San Francisco. The examiner might conceivably ask a hundred questions, all of them designed to establish the truth or falsity of the witness' main contention. The latter might answer 99 of them in such terms as would be consistent with his avowal, but if the disclosure on the hundredth question were that he was in St. Louis when the crime occurred, the whole fabric would fall to the ground. The witness would not have a reliability of 99 on the percentile scale but rather no reliability at all. Valid inference is upon the meaning of the examination as a whole and not upon any percentage of rights and wrongs. So shall we find it when we come to study testing as a feature of operative technique.

In general, in the wholly praiseworthy passion for objectivity the student ought to remember that purely objective results the meaning and bearing of which are obscure and uncertain are decidedly less valuable than other results which may be lacking in precision and which are in the form of inferences from observed facts rather than the facts themselves, provided the latter type of results have indubitable bearing on the issue at stake. An evolving science must creep for a long time before it can walk.

ORGANIZATION IN UNITS ESSENTIAL TO APPRAISAL.—Such being clearly the case, there is undoubtedly implied, for appraisal of pupil progress as well as for teaching, an analysis of the whole process of general education into the learning units which are of necessity its content. Such an analysis would carry us far beyond the scope of this volume. After all, our discussion herein is concerned with teaching and not with the curriculum, conceived as the content of education, nor with the program of studies, conceived as the organization of the curriculum for teaching purposes. Nor is such an undertaking essential in the present connection, for every school, up to and including college, has its own curriculum made up of a content which the school conceives to be best fitted to the achievement of its purpose. The present problem is to effectuate that curriculum in the teaching procedure

which is employed. A curriculum is nothing more than so much paper until it is taught.

At the beginning of the secondary period, the issue is simply, Has the pupil the major primary adaptations, not a matter of how many grades has he been promoted and not a question of how well he has done. If the teaching technique of the primary school, including proper corrective and remedial teaching, has been systematically and effectively focused on its own proper objectives, the pupil will have the primary adaptations, and all of them, or else he will have been positively identified as a probable pathological case.

BOOK LEARNINGS.—From the beginning of the secondary period to the end thereof, every curriculum subject can be analyzed into its essential unit learnings. Pupil progress becomes then a matter of mastering the several units within the field of each curriculum subject studied. He does not “study” geography or United States history or French or algebra or English literature—he masters the learning units within each of these fields. In some fields there will be many units and in others, for instance the reading course in a foreign language, but one unit. The subject fields themselves cease to have any critical administrative meaning; they become simply convenient descriptive terms. Progress is appraised, not by a system of credits for courses, or even for units, but simply by recording the learning units mastered, bearing in mind that each unit stands, not only for significant knowledge which must be acquired, as for instance the notion of gravitation, but also for the inward change in attitude in the pupil which can be tested and verified.

Education in the secondary period is concerned, however, not only with the adaptations which arise out of the use of book material but with others as well.

PHYSICAL DEVELOPMENT.—It is concerned with the physical development of the pupil, and here progress is not in terms of the number of gymnasium or health courses which he has had but with actual growth both in normal physical development and in

the health attitudes he has taken on. Gymnasium exercises and health talks may be the means by which growth is stimulated and controlled, but they are clearly not the growth itself. Here, again, analysis of the teaching objectives gives us the unit learnings to be mastered. Appraisal of progress consists in recording the achievement of unit learnings or steps in normal development.

RIGHT CONDUCT.—We are vitally concerned with the development of right conduct in the pupil, that is to say, with his volitional and ethical evolution. Now here, as in the cases of physical development and the adaptations which are acquired from the book courses, it is perfectly possible to map out, at least to useful approximations, the major units in which the normal volitional and ethical development consists. They are patent in our collections of case histories, and the principal units are exhibited and discussed in chapter xx. Each of these steps in development is as capable of observation and verification on evidential grounds as are the unit learnings in algebra, or the development of taste in literature, or the maintenance of the normal height-weight ratio in physical growth. The mastery notion applies. The pupil has either passed into the normal altruistic attitude of early adolescence or he has not. He has either come to practice willing obedience to constituted authority or he has not. Again, appraisal of progress consists in recording the unit adaptations which the pupil has made and for which we have evidential tokens. The contrasting method is an exhibit of traits in which different teachers rate the pupil on a fivefold distribution. In the former, we are dealing with evidence of adaptation; in the latter, with estimates of performance in terms of rank in class. In one, we are identifying steps in the pupil's growth, which can be trusted to control his unconstrained behavior in the world; in the other, with only personal views of the present situation.

THE FALLACY OF EDUCATIONAL LEVELS.—Thus we can at any point between the end of the primary period and the end of the secondary describe the pupil's progress but we cannot define the extent of his education. We can list on a card the unit learnings

which the school curriculum implies and record the unit masteries in the case of a given pupil for which we think we have evidence. We can then present the card to the inquiring person as a description of present status for such interpretation as the latter may think warranted in the premises. There is doubtless always the temptation, which assails the administrator and it may be the student of education, with special force, to set up convenient levels within the secondary period and to attempt thus to define educational progress. To do so is to deceive one's self, and we presently begin to think again in terms of administrative and investigational stereotypes instead of in terms of educational reality. Indeed, the reader must be warned that in reading the present volume he will frequently encounter such expressions as "elementary-school level," "high-school level," "junior high school" or "senior high school" or "junior-college level." Such terms are used only as convenient descriptive phrases chiefly for the purpose of relating our discussion to institutional arrangements with which we are all familiar. Elementary education, or high-school education, or college education, are all, on our principles, merely colloquial terms. Primary education and secondary education we can define.

V

VALID "MARKS."—The foregoing statements are inevitably challenged by the query, "Shall we then abandon school marks altogether and if so do we not thereby plunge into the administrative chaos of a system which has no records?" It is perhaps pertinent to remark in passing that administration exists for the school and not the school for administration. If the question has reference to marks which are *performance grades* and which inevitably tend themselves to become the objectives of the school processes, to the displacement of the learning objectives proper, then the answer is "Yes, in principle they ought to be abandoned altogether." If, on the other hand, the mark assigned is purely a convenient stenographic sign which is useful as a short-cut to a descriptive record, then marks are not only not to be abandoned,

but on the contrary they become an essential feature of valid administrative technique. To illustrate:

The use of a percentile series such as 60 per cent, 70 per cent, 90 per cent is not only a pedagogical but also a mathematical fallacy. Pedagogically, it is an attempt to scale the teacher's estimate of performance, and the passing per cent becomes the objective of learning. The lesson-learner is rewarded and the true learner is heavily penalized. The per cents, on the other hand, are not true mathematical terms at all, but rather expressions which stand neither for quantity nor for measured relationship. They are rather symbols of teachers' judgments of the value of performance. If they were in truth mathematical expressions, then mathematical operations might be performed and the result would be valid. Since they are nothing of the sort, mathematical operations lead to ridiculous fallacies. For instance, 70 per cent and 80 per cent are symbols of the teachers' estimate of the value of performance. So far so good. But the mean of the two, or 75 per cent, is the mean of two symbols which express judgment of performance. It is not mean performance, but that is what is recorded. When an actual count is taken, such as, for instance, number of rights in spelling exercises, then a true mathematical situation exists. The mean of the results in several such exercises does truthfully express average rights per exercise.

On the other hand, the customary five-point distribution expressed in the letters A, B, C, D, F is perfectly valid so long as it represents the teacher's judgment of relative performance in class, in which C stands for mediocre performance in that particular group, A for the best, and F for the worst. The principles of normal distribution can even be applied as a check on the validity of the teacher's judgment. But the grades are performance estimates pure and simple, and, as such, the grades themselves become the learning objectives. Worse than that, they are mere estimates of relative performance in a particular group. A may stand for the best performance and yet be very poor performance indeed. Learning is not in the picture at all.

Now, when we think we have evidence of the presence of a given learning, we may enter the title of the unit and record opposite the pupil's name M or A or L, # or ¶ or β , or any other shorthand term which we have agreed shall stand for mastery. We may record M and N thus, MN, and agree that the record shall mean that we have evidence not only of mastery but also of genuine and consistent cultural interest. If we desire further a performance record, we may enter $M_{110}N$ and agree that the expression means that we have evidence of mastery, plus a skill rated as 110 on a standardized test, plus evidence of cultural interest.

In this case, the learning product itself becomes the obvious objective and not the performance grade assigned.

VI

In the analysis of appraisal of pupil progress, we thus come to the end of the secondary period and to the end of general education in the technical, formal sense of the term "education." Beyond that lie the university and the professional school.

When the pupil has mastered the various units of learning which the school conceives to be the appropriate content of general education, and when the evidence shows that he has reached the point at which he can and will study without constraint, can and will apply the learnings which he has taken on in school in the intelligent formation of his opinions and in the conduct of life, then the pupil has reached educational maturity and the end of the secondary period. The school has a clear right to define him as an educated man, within the terms of its own understanding of the content of education.

CHAPTER VI

OUTLINES OF SYSTEMATIC TEACHING

THE primary consideration, then, in any teaching enterprise, whether it be a book course or the development of conduct or the care of the pupil's physical well-being, is the identification of the learning units.

THE MASTERY FORMULA.—The units having been identified, the next problem is the technique of pedagogical attack. Here we apply what we shall call the "mastery formula": Pre-test, teach, test the result, adapt procedure, teach and test again to the point of actual learning. It will be noted that this is precisely the procedure adopted by other practitioners who work in the field of organic changes. The physician, for instance, who undertakes the cure of a patient, first makes his diagnosis, then formulates and applies a treatment, then tests the results of his treatment, modifies treatment in accordance with his test results, and so on to success or failure. Even if he fails, the physician is eager to know why he failed. He does not merely dismiss the case with the verdict, "Failed to recover," or, in performance terminology, "Failed to pass." Again, the agriculturist, in handling a crop, first analyzes the market and the soil which he has available, formulates a procedure, applies his cultivation, tests growth, applies correctives, and so on to the harvest. The scientific teacher compares with the agriculturist, the lesson-hearer with the peasant farmer. We refrain from drawing the parallel in the case of the physician. The most important difference between the teacher and these other practitioners is to be found in the fact that the latter enjoy the resources of well-developed sciences, while the teacher's science is still in its infancy.

I.

PRE-TEST.—There are few units, indeed, in the secondary school in the approach to which the pre-test can wisely be omitted. It serves two important purposes: first, it orients the teacher and gives him ground for intelligent approach to the particular problem before him; and, second, it tends to establish in the minds of the pupils a connection between prospective learning and present attainments. It may, in rare instances, disclose the fact that one or more pupils may be excused from presence in class during the learning process as applied to the particular unit, on the ground that they have already attained the learning for which the unit stands. Now and then a pupil may be found on the pre-test of the first unit, if there are several units, who reveals evidence that he need not take the course at all. This is likely to be the case in courses in English written expression especially and is often the case in elementary science.

In practice, the orientation of the teacher is perhaps the matter of most importance. Teachers are prone to take specific preparation for a given unit or course for granted. It thus often happens that, while the section is in general ready for the unit, there are details which, if left untaught, will create wasteful and perhaps fatal inhibitions. This is particularly true of the technical vocabulary of a science. It is perhaps unnecessary to emphasize the principle that the result of the pre-test is no part of the system of appraising pupil progress. Its office is purely to throw light on the teaching process, and to include its results in any average of marks, if such still exist, is of course pedagogically absurd.

With the teaching member of the mastery formula we have little to do at this point. Part III in its entirety deals with that factor.

TESTING AND RETEACHING.—Nor is there needed extended comment on the teaching test. We shall have occasion to deal with the matter in detail later. Suffice it to emphasize the principle that the results of the testing member of the mastery formula are purely for the purpose of deciding: first, whether or not

the teaching has in fact registered and the teacher can now go on to the next step or the next unit; or, second, what modification of procedure is needed, assuming that the test discloses that the teaching has not fully registered. The results are no part of the final appraisal of the pupil's progress. To include them would be as absurd as it would be for the physician to submit an average of pulse, respiration, blood count, urine content, throughout the history of treatment, as his final evaluation of the extent of the patient's recovery. In the case of both patient and pupil, it is the final condition alone which is significant. The test results may be way-marks as well as guides on the road to recovery or to mastery, but they are not themselves any part of recovery or of mastery.

When the result of the teaching discloses non-learning in the class as a whole or in any significant number of pupils, there is first indicated due study of the meaning of the test results. Mere scoring a test will not suffice. Every set of such results is a body of phenomena which arose in some sequence of cause and effect. As such they have meaning, and the meaning can usually be found by the teacher who is actuated and guided by scientific motives. Putting the test results and the teacher's recollection of the teaching procedure together, there should emerge an hypothesis touching the character and location of the fault in the teaching. The teaching is then redirected and the element is retaught. Lest the term "teaching" should mislead the reader, we note that reteaching may very well at certain stages take the form of re-direction of study or other forms of pupil activity.

Now, it is exceedingly important that the teacher give to the results of teaching tests this serious study before reteaching. The routinist falls into the error of testing, scoring the result, and reteaching without surveying the ground. He may well repeat this process indefinitely before he makes his point register, with great waste of time, energy, and pupil interest, or may fail altogether and hastily conclude that a great share of the pupils are non-learners, and were predestined to be such from the founda-

tion of the world, or else that the "method" is a failure. Before reteaching at all, every effort should be made to find out what the trouble is. We recount here illustrations showing the kind of trouble which the test may disclose.

CAUSES OF NON-LEARNING.—Perhaps the commonest cause of non-learning is poor attention. The teacher finds that his teaching did not "get across" and recalls that he paid little heed to the task of holding the class. He was so interested that day in the subject matter that he overlooked the pupils. Now so sensitive is a class to the personality of the teacher, in certain aspects of technique, that even a seat outside the line of the teacher's gaze—in a front corner of a square recitation-room, for instance—will sometimes make the difference between learning and non-learning. The teacher can then be very confident that, if he recalls poor control, he has at least one probable reason for the poor results on the teaching test.

It will sometimes happen that a teaching test shows that nearly everybody got half of an explanation and that very few got the other half. The author had such an experience not long before these lines were written. On reconsidering, he found that he had used in the second part of a lecture material which only a part of the class were qualified to receive. In such cases the correction is obvious.

In subjects like languages, in which learning arises out of practice, the teaching test will frequently disclose as non-learners individuals who either are slow reactors or require unusually long practice at a given level before progress in learning sets in. The corrective procedure here implies resectioning the class after the slow learners have been positively identified. It by no means follows, of course, that this is the only cause of non-learning in a language course.

Not infrequently, in subjects like grammar, mathematics, and the sciences, the teacher ultimately finds that he is trying to teach an uneconomical or even an impossible unit. Commonly the unit is not extensive enough, or it may be a unit which corresponds to

no possible adaptation, in other words there is nothing to be understood, or no value to be appreciated or no ability to be acquired. In a certain case the unit selected was a somewhat narrow phase of indirect discourse. The test on both teaching and successive reteachings showed a very unsatisfactory state of learning. The unit itself was then expanded so as to include a much wider body of principles. The reteaching now cleared up the situation with all except a few pupils. Apparently the pupils could not understand until they could see the unit as a whole, that is to say, the real unit.

It may transpire from the evidence of the tests that the course itself is an impossible one.

The foregoing illustrations are of course merely typical of what the teaching test may reveal and the appropriate corrective procedure.

Such is direct teaching of the learning unit, or, on our principles, teaching as distinguished from lesson-hearing in any of its forms. The essence of the matter is application of the mastery formula, and the root of the latter is the teaching test and reteaching. From the pupil's point of view, the issue is, "I do not catch the idea, please repeat"; or, perhaps, "Tell me wherein I am wrong, in order that I may correct myself." The teacher who fails to heed this aspect of the pupil's attitude, grades performance and passes on ~~seems to me to be guilty of~~ a peculiarly contemptible piece of malpractice.

Reteaching is often misconceived as mere tutoring. The euphemistic term is "helping the pupil." As such, the process rapidly degenerates into mere doing the pupil's learning for him, or at least attempting such an impossible task. "After-school classes" are very prone indeed to become routine tutoring periods, though not necessarily such. When teacher and administration work together in an intelligent handling of the whole teaching problem, no such devices ~~are called for~~.

Reteaching is sometimes formalized as doing tasks over again with the result that there is built up in the pupil the attitude "Oh

well, I shall have another chance." Of course this is the get-by attitude in another form. It has been a troublesome obstacle in the laboratory and doubtless other schools have encountered it.

Testing and reteaching is a continuous process. Testing is not only applied to the issue, Has the pupil learned? but also to the issue, Is the pupil learning? Some units may require several weeks in their learning, and some of them several years. The reading unit in foreign language, for instance, usually implies a growth period extending over many months. Some of the conduct attitudes are developing throughout the whole period of general education. Hence, to leave reteaching to the point at which it is estimated that mastery of the unit ought to be present, is practically to confine the whole educational period to a single unit, or else to leave every unit unlearned.

EXTENT OF RETEACHING.—Two questions are now naturally suggested: How many times should reteaching be done? For what proportion of pupil failures on a teaching test should the whole section be retaught?

In general, reteaching should be done until mastery takes place. There is a pedagogical problem to be solved, and it is the teacher's business to find the solution. The number of reteachings required is a measure of the teacher's professional equipment and skill. Ordinarily, the teacher who is willing to study the problem will find that the number of reteachings required steadily diminishes as the course goes on. The teacher becomes better adjusted to the class and the pupils become better learners. Nevertheless, the reteachings may keep tediously up, and after a time the problem becomes critical. There is then indicated a broader study of the whole situation. The teacher may well find it necessary to call into consultation one of his associates and the supervisory help of the principal's office. A fault hitherto unnoticed by the teacher may be discovered. It may be found that the course has been unwisely placed in the program of study. It may be found that the class is, in fact, so heterogeneous that it cannot be taught as a single section—a situation, by the way,

which is almost certain to be encountered periodically in the graded system under the lesson-learning and passing-grade teaching procedure, for the simple reason that a section is bound to include numerous non-mastery promotions, that is, pupils who have not acquired earlier essential learnings. Whatever is found should be found as matter of fact on evidential grounds and not as matter of mere guesswork.

Theoretically and ideally, whenever a pupil has learned, he should go on with his learning even though he be the only one in the section to do so. Practically, it does not altogether work out that way. Assuming that the section is reasonably homogeneous, that the pre-test has been properly administered and followed up, and that the teacher's control of attention is adequate, the early teaching in a course is apt to disclose something like the following situation.

On the teaching test, perhaps one-third of the class shows evidence of learning. On the retest, another third shows that teaching is registering. On a second retest, all but two or three in a class section of thirty respond. Now, shall the first third submit to reteaching twice and the second third once after they have responded to the test? The teacher's best judgment will have to settle the matter, and we trust that subsequent chapters will more and more give ground for judgment. When as large a proportion as two-thirds fail to respond, it is worth while to verify the learning of the first third by reteaching and retest, and even a second round of reteaching. It not infrequently happens that some of those who responded on the first test do not respond on the second retest. Either the first test was not conclusive as a test or they made simply a fortunate response. Further, when the test gives room for qualitative differences in the response itself, the response of some of the last third is often better than that of the first third on any of the tests, that is, it is better evidence of the presence of learning. The fast learner is not always a sound learner, nor is the slow learner always a poor learner.

The small remainder of the pupils are indicated for special in-

dividual treatment. On the next unit, one or more of them may pass out of this group and others may join it. Ordinarily, however, something like 5 to 10 per cent, it may be, will segregate as non-learners and linger farther and farther behind the body of the class group as a whole. These soon become registered as "problem cases" and perhaps as "remedial cases." They form an important subject of discussion in Part IV. It is essential to note here that they are positively identified as non-learners, instead of being simply cast to one side as people who failed to make a passing grade and are futilely required to repeat the course. The teacher knows that they are not learning, and forms a tentative hypothesis of the reason why they do not learn. They differ from the "corrective cases" who are for a time in and out of the lagging group but who eventually catch the stride and go on with the progressing group. Since we shall have occasion frequently to use the terms which have been quoted, let us adopt them into our terminology and find for each a definite meaning in the following manner.

THE PROBLEM CASE.—A *problem case* is a pupil who is so far from responding to the routine instruction to which the class group as a whole responds that he requires special individual study and treatment.

The problem case is a *corrective case* when the difficulty is not such as to make necessary segregation from the group.

The problem case is a *remedial case* when the difficulty does not respond to corrective measures within the class group. In such cases, the school must set up an organization for special study and special remedial treatment. Such treatment may go on within the school or it may be necessary to invoke outside agencies. A common-enough cause of remedial cases is a history of non-mastery in the earlier school life. The pupil does not learn simply because he has not the ideas and the thinking methods which are essential to learning. For such, the school sets up a group or groups for correcting this malady in the learning process. In another case, the cause is identified as defective vision or

hearing. The pupil is sent to the appropriate specialist. In a third case, the cause is found to be seriously defective nutrition, and it then may be necessary to find means for a course of dietetic or medical treatment. Finally, careful working out of the case and family history may disclose that the pupil is indeed a mental defective, and in that case he is sent out of the class altogether.

A little reflection will make it clear that the number of problem cases will be reduced year by year in proportion as the theory of teaching in the school system as a whole is successfully reduced to a systematic basis, in the place of the lesson-hearing routine.

THE RAPID LEARNER.—What shall we do with the really superior learner, the pupil who has perhaps native gifts and with him who through fortunate experience has acquired proficiency in the art of learning? Shall we keep him waiting throughout the tedious process of reteaching?

In the first place, as we have seen, it often happens, especially in the lower levels of the secondary school, that the superior pupil greatly profits by reteaching. The superiority of bright pupils is very apt to consist rather in mere mental smartness than in solid qualities. Not infrequently, what this type of pupil most needs is the discipline of learning to “sweat out” thoroughly a piece of learning which his brightness enables him to acquire rapidly but superficially. We have further seen that when we apply the mastery formula the pupils who respond to the teaching test are not invariably those who respond to the first retest.

Again, even those who do not respond until the second retest on an early unit are not infrequently those who eventually become the superior pupils. In a systematic laboratory test of pupil progress, day by day until fifty days had gone by, with no corrective treatment, the most striking disclosures turned out to be the extent to which the pupils shifted places in progress from day to day, the frequency with which the slow learner was a sure learner, and the lack of correlation between the mental-brightness scale and rate of learning.¹ Finally, even rather obstinate

¹ See Beauchamp, *Studies in Secondary Education*, Vol. II, “Supplementary Educational Monographs.” Chicago: University of Chicago Press, 1925.

remedial cases are sometimes adjusted and become identified with the superior-pupil group.

Nevertheless, certain pupils do develop superior learning capacities as unmistakably as some of the problem cases become identified as non-learners.

In some instances, we may very easily find that their superiority consists mainly in the fact that they do not need the course. They have already acquired all or nearly all of the learnings which the course contemplates. They may be released from class work, perhaps called to report independently on a few units still needed, and assigned to another course. The following is a case in illustration. In a certain college, all Sophomores were required to pursue elementary courses in physics and chemistry. Because the majority of students were found to have no adequate foundation for the courses, a class was treated as it would properly be treated if no student had such preparation. It so happened that several students would be found each year who in fact had all the learning which the courses contemplated and more. Naturally they at once became conspicuous as superior students and in the routine of appraisal by rank in class were credited with an element of superiority which they did not possess. In terms of real learning products, their personalities were unfavorably affected in that they were given an utterly false sense of their intellectual attainments, time was wasted which should have been devoted to courses of which they stood in great need, and to some extent the process of general education was needlessly prolonged.

In some courses, particularly in language, in which the assimilative experience is a series of exercises, the pupil may be transferred to a more advanced section.

VOLUNTARY PROJECT.—In the majority of cases, however, the supplementary project is the most useful recourse. For each unit, an ample series of such projects is kept before the class and each pupil is allowed to select. Some may not select at all, and this has an important significance. Some work at a single supplementary project during a large part of the year. Some work out

several such during the year. Thus the superior pupil validates his superiority, not by rank in class, but by the acquisition of additional masteries. It is sometimes objected that this is not "fair" to the superior pupil, since it requires him to do more than others do. The objection is of course purely an instance of the performance stereotype at work and the commercial view of education. If education is a matter of contract between pupil and school in which the pupil does certain work in consideration of credits and an ultimate diploma which the school covenants to award, then the objection holds. If education is conceived as a process of superior adjustment, then the supplementary project is a rare opportunity to the superior pupil, on the one hand, and evidence to the teacher of growth toward intellectual self-dependence, on the other.

Now, the whole theory of systematic teaching rests upon the mastery formula and its application. It does not guarantee success to all teachers nor to any teacher for all pupils; but it does furnish a method by which such progress as is made can be real progress, and it furnishes a method by which the individual pupil can be duly given that consideration to which he is entitled by a society which brought him into the world without his will or wish. More than that even, it gives us a theory of teaching, on the basis of which may be developed actual individual self-dependence, in brief, citizens who are capable of thinking for themselves in the place of citizens who merely assert the right to think for themselves. Finally, it makes teaching, as a systematic procedure, a soluble problem, whereas it is otherwise merely a routine with no problem conception about it.

We must now turn to the types of teaching found in the school.

II

TYPES OF TEACHING.—Most theories of teaching have been founded on the assumption that all teaching is one, that a theory of procedure can be found which is equally applicable to all subjects found in the school. In a sense this is true for there are cer-

tain laws which apply in one form or another to all forms of learning. Among these are the principle of apperceptive approach, the principle of motivation, the law of initial diffuse movements, the canon of the concrete before the abstract. In the theory which we here advocate, we make large use of the principle that all real learning, except the learning of skills, is in the form of adaptations in the individual. Nevertheless, a workable theory of teaching must take into account the fact that the character of learning, the nature of the essential objectives sought, and consequently the teaching process itself, all differ in important details as we go from one subject to another in the secondary school. We can, however, group all the subjects taught in the field of general education, and indeed in the field of vocational training so long as it is at the secondary level, into five different types, which characteristically differ among themselves in the nature of their objectives and in the nature of the learning process.

SCIENCE TYPE.—The first is that which we shall denominate the science type. The objectives here are adaptations which are in form understandings of principles or processes in the relation of cause and effect. The method of learning is a process of reflection and rationalization. The product in the case of a particular unit is an intelligent² attitude toward some aspect of the environ-

² In current writing there is a great deal of confusion in the use of the terms *mind*, *personality*, *intelligence* and their cognates. What meaning is attached to a word is of little consequence so long as there is general agreement among writers as to the meaning, and especially so long as a consistent use is employed by the same writer. But the use of these terms is not well agreed upon and even in reputable scientific books the terms are used inconsistently within the same volume. For example, it is not uncommon to find writers who insist on distinguishing between personality disorders and mental deterioration and then discuss maladjustments which within their own definitions are maladies of the personality indiscriminately as mental disease. Again, we find references to the intelligent practice of a profession, meaning a practice which is on scientific principles, and in the same volume intelligence employed in the same sense as that in which we speak of our intelligent dog. Colloquial use is seldom sufficient for scientific purposes.

Throughout this work the term *mind* is used to mean that aspect of the adaptive organism which is psychical rather than physical in its nature. Thus memory,

ment or of a science. The schoolroom subjects which in the main classify under this type are mathematics; the grammars of both the vernacular and non-vernacular languages; the principles of ethics and logic; the physical, biological, and social sciences, including history; the theory of music and the other fine arts; such courses in household arts as home management and home economics; such courses in commerce as transportation and commercial law; and, in short, courses in any field in which the learning units eventuate in *understandings* or *rationalized insights*. This type is one of the three fundamental types in which adjustments in the form of new attitudes takes place.

APPRECIATION TYPE.—The second of the three fundamental types is what we shall call the *appreciation type*. The learning units here are in the form of adaptations in terms of which are valued those products of civilization which are and have been contributed by the fine arts, by religion, and by the best examples of moral behavior. Adjustment is in terms of *value attitudes*.

image-formation, perception, judgment, reasoning and their cognates are terms which refer to mental functions in experiential and adaptive processes. Similarly *mentality* refers to the quality of mental function. If we wish to be more analytical, we speak of *perceptual capacity*, *reasoning capacity*, *imaginative capacity* and so on. If we wish to relate mentality to learning, we use the term *organic learning capacity*. The evidence is on the whole to the effect that mentality can be improved little if at all by training or education.

Personality, on the other hand, means, as the reader has no doubt seen, the outcome of learning and adjustment in the life of the individual. It bears much the same relation to mind which the beauty and fragrance of a plant bear to the organic processes which have produced the plant. It is a social term, for nothing like human personality could exist outside of the social institutions.

Intelligence in its exact etymology means understanding, comprehension, exact knowledge. It implies learning and is therefore properly a term in the description of personality and not a mental term. Thus we say that an individual is "intelligent" about this or that, radio-telephony for instance, meaning that he has acquired insight into a body of principles which enables him to rationalize the situation in which he finds himself. When we speak of "intelligent teaching" we mean teaching which is carried on in conformity with certain principles, in contrast with teaching which is blindly followed.

Thus, while mentality cannot be an objective in education, intelligence is one of the chief final products of education.

Within this field are also found those learnings which are expressed in attitudes toward conduct. The adaptations may imply enjoyment or they may imply willing devotion. Psychologically, the type is concerned with the affective side of man's nature.

PRACTICAL-ARTS TYPE.—The third of the types out of which arise the fundamental adjustments to environment we shall call the *practical-arts type*. The objectives here are learnings which lead to the intelligent manipulation of appliances and molding of materials, and thence to adjustment to the mechanical environment. The learning process is specifically different from that required by other types and therefore the type has its own specific operative technique. There are included here most shop courses in the mechanical arts; such courses in household arts as cooking, sewing, and dressmaking; such courses as drawing, painting, and the plastic arts.

Other courses which are commonly associated with these, and for which the same school departments are ordinarily responsible, must be managed under other types of teaching, according as the objectives and the learning process dictate. A course in applied electricity, for instance, may be offered by the mechanic-arts department. It must be taught according to the principles of the science type. The household-arts department offers courses in home management and in home economics. If the courses are to have a valid intellectual foundation they will need to be taught according to science-type principles. On the other hand, the same department offers courses in household art. Here, the objective sought is in the form of aesthetic adaptation, and the principles of the appreciation technique must be applied.

On the other hand, the teacher of physics, chemistry, or biology, especially at the upper levels of the secondary school, sometimes has occasion to use the appropriate laboratory facilities. There is implied the skilful manipulation of appliances. The laboratory aspect of these sciences frequently fails as a serviceable part of the study process because the student has not the requisite manipulatory skill. The essential teaching process in-

volved in these sciences is that of the science type. Nevertheless, the teacher who expects to make effective pedagogical use of the laboratory must turn from time to time to practical-arts principles in order to develop the capacity to use effectively the laboratory apparatus.

Again, the teacher who has to do with the use of drawing, clay-modeling, and the like, for the development of appreciation of artistic values is chasing a pedagogical will-o'-the-wisp unless he is content to utilize practical-arts principles for the development of some skill in manipulation before expecting the aesthetic adaptations to arise. Learning to draw or to manipulate color so that the result will express a certain mental content is one thing; the refinement of aesthetic judgment is quite another. Conversely, at some of the higher levels, creative artistic performance is undoubtedly a powerful experiential factor in the development of the more refined aesthetic adaptations.

"CREATIVE ACTIVITIES."—The foregoing paragraph suggests a critical appraisal of the pedagogical value of what has come to be known as "creative" learning. Resting on the principle that skilled artistic performance does give access to experience out of which higher and more refined appreciative learnings can arise, the inference is drawn that 'training in writing literature, in expressing beauty with the brush or modeling apparatus, in musical performance, are all of them the natural and essential approaches to humanistic values, that is, to appreciations.' The notion is an old one and it has at one time or another been applied to other types of learnings as well as to appreciation. For example, in nineteenth century America, "musical education" was conceived to be requiring inept boys and girls to "take piano lessons." The effect in musical appreciation is a painful memory. The advent of mechanical devices for the reproduction of musical masterpieces seems largely to have relegated "creative performance" in this field to qualified artists.

When the natural sciences came finally to be accepted as part of the curriculum, university scientists hastened to displace the

original and really productive natural history approach and to substitute elaborate scientific laboratories in the high schools. The purpose was to teach science by making scientists out of immature pupils. Of course it cannot be done, but we still squander money on elaborate high school laboratories and befuddle pupils with exercises which are appropriate to the advanced student.

Again, in the early stages of the manual arts movement, the attempt was made to induct pupils into their practical arts environment by making them over into carpenters, blacksmiths or machinists, regardless of their ultimate destiny in life.

First and last, all of these interpretations of the teaching process have rested on the fundamental fallacies which we have so often noted, namely the confusion of learning and performance, of erudition and education, of experience and the learning which arises out of experience, of the secondary school and the university, of fundamental adjustment and the skills which can be built on adjustment.

// LANGUAGE-ARTS TYPE.—The types which have thus been enumerated and characterized are fundamental in the sense that out of them arise the adaptations which make up the educative process, the adjustments which constitute education and result in personal maturity. The form of teaching which is of *primary* importance, however, is that which we shall call the *language-arts type*—of primary importance because out of it arise the adaptations through which access is had to most of the materials of learning. It is the type through which the use of spoken and written discourse is learned, but it is far from being limited to the learning of language. In general, it applies to the learning of any method of receiving or expressing thought or feeling in the form of continuous discourse. The infant's learning to talk is an example of language-arts learning. Learning to read and write the vernacular are other examples. Learning English composition, the use of foreign language, stenography, are still others. The learning of musical expression, either through the medium of the voice or through that of instrumentation, is also subject to

the principles of the language-arts type. The essence of the type is some form of running discourse. Thought and feeling are expressed in other ways, for instance through scientific formulas, on the one hand, or through the pictorial and plastic arts, on the other; but in these cases there is no discourse element involved.

In this type as in the others, we find associated elements of learning which do not conform to the type. In the learning of languages, for instance, it is commonly necessary to learn the grammatical structure as well as the discourse use, and the two cannot be learned simultaneously, much less through the same form of teaching or the same learning process. The discourse use is a language-arts type; the grammar must be learned on science-type principles.

Similarly, in the discourse teaching itself, we frequently encounter situations in which a different type of teaching must be summoned to our aid. In the teaching of a foreign language such as French, for instance, the process of vocalization frequently calls for use of the principles of the pure-practice type discussed below. In teaching the use of some musical instruments, the point is soon reached at which the pupil is obliged to acquire certain neuro-muscular facilities which must also be learned by pure practice.

PURE-PRACTICE TYPE.—There remains a field of learning, commonly found in the secondary school, in which the objectives are in the form of automatic facility, and the learning process is pure repetition until the adaptation sought becomes established. To this field we apply the term, the *pure-practice type*. To be sure, all learning implies practice. In the science and appreciation types we shall find long experiential practice with assimilative book material. In the practical-arts type, assimilative practice with appliances and materials is essential. In the language-arts type, the learning process is little more than practice with discourse of one form or another. In all of these, however, higher mental content is involved. In pure practice there is no thought content whatever included in the learning process itself,

although the objective may, in some cases, be the automatizing of certain products of learning which are in themselves content in the mind.

We may distinguish two subtypes:

The first of these is that field in which a new special ability is gained by pure practice. Typical of this field is the learning of the primitive neuro-muscular adjustments, such as walking, swimming, skating, and the like. In the secondary school, the best illustrations are perhaps the training of the vocal organs for the purposes of foreign language and vocal music. Finger exercises in musical instrumentation also conform to this subtype.

The second of the subtypes has for its objective the fixing in mind of elements which are constant in character and which require no adjustment to the content in which they are from time to time found. Two times two is always four, anywhere in the world in any possible content. *M-a-n* always spells "man," but the meaning of "man" differs materially according to the context in which it is found. The spelling can be learned on pure-practice principles; the meaning grows out of language-arts learning. The outstanding illustrations of the subtype are of course the tables in arithmetic and spelling.

A variation of the second subtype has for its objective the fixation of convenient formal elements which have been developed through another type, usually the science type or the practical arts type. For instance, the formula for distance traveled by a moving body under constant acceleration will be an element in a unit mastered under the science type, and it is worthless to the educated intelligence unless it has been so mastered. Ordinarily, the formula will be recalled without great difficulty by anybody who has once really learned the principles involved, but it is sometimes desirable so to automatize such elements that they are recalled without the intervention of the reflective process. Much the same need exists in the case of well-worded rules, in mathematics and grammar especially. Here are again cases in which when certain adaptations in the science or practical-arts types

have once been mastered, it is convenient in subsequent economical learning to have verbal statements so automatized that the previous learning is made rapidly available.

Some of the older schools made good use of this second subtype and thereby sometimes contributed a certain efficiency to the study processes which was of the greatest convenience. They were very likely to neglect, however, to establish the fundamental learning for which the rule or formula stood and thereby set up the type of learning popularly known as "parroting."

The characteristic and most searching test of the pure-practice adaptation is ability to use the power to which it corresponds while something else is focal in consciousness. For instance, no pupil has acquired an effective use of the multiplication table unless he can use it correctly while thinking of the conditions of the problem to the solution of which the table is in part applied. Similarly, nobody can spell efficiently unless he can use words subconsciously in their correct form.

CONSEQUENCES OF TEACHING UNDER THE WRONG TYPE.—It would be of little use to enumerate these different types of teaching, if to do so were merely to set up a convenient form of classification. Such, however, is not the case. Each type stands for a form of learning, and consequently for a teaching procedure which is appropriate to the specific objectives within the type and to no others. A language-arts objective cannot be attained under the principles appropriate to the science type. Nor can a science-type objective be reached under the principles of pure practice.

There is perhaps no single factor so commonly responsible for non-learning and perverted learning as persistent attempts to achieve a given learning product under the wrong type of technique. In many schools, practically the only type employed is the science type. That is to say, the attempt is made to reduce everything to terms of understanding or rationalization. While the actual outcome is greatly obscured by the lesson-learning theory of instruction, the actual product, as far as there ever is an actual product at all, is always only that which can be attained under

the type of teaching used. No better example can be found than the result of attempting to teach discourse under the science type. The outcome is understanding of language structure and ability to decipher discourse but not ability to read or to think in the new tongue. Similarly, the attempt to develop appreciation of literary values under the science type may lead to understanding of the conditions under which literature is produced, but it never results, except casually, in a taste for that kind of reading.

On the other hand, failure to note the significance of difference in types of learning and teaching very often leads to assembling incongruous elements in the same course or sequence. Perhaps our best illustration is in the field of English. In courses or parts of courses offered by the English department, there are at least four different types of teaching. Grammar is a science-type subject. Literature belongs clearly to the appreciation type. Composition is a language art, and spelling is most effectively learned on pure-practice principles. Grammar is pedagogically as different from literature as is algebra different from sportsmanship. The fact that all these subjects are logically classifiable as English is of little moment in comparison with the fact that pedagogically they are of four different kindred. Further, the teacher who is well adapted to instruction in grammar is often wholly unadapted to successful teaching in literature.

III

NON-TEACHABLE MATERIAL.—Closely related to our consideration of the types of teaching is a needful consideration of the non-teachable material which has found its way into the textbooks which have been constructed to meet the requirements of the ground-to-be-covered or information theory of education. The material in question is non-teachable because it bears no relation to the development of understandings, appreciations, or abilities in the pupil. It does not correspond to any adaptations as such, nor is it utilizable as assimilative material. To coin an expression, it is mere educational journalism.

A standard text in chemistry much used in the secondary school, both high school and college, after developing the fundamental chemical principles, devotes nearly one-fourth of its pages to a multitude of short paragraphs on various aspects of metallurgy, the rare earths, etc. If the material were really teachable, it would correspond to several advanced specialized courses. As it is, there is no body of principles to be mastered, and, if there were such, there is not assimilative material enough to make the learning of the principles anything more than memoriter exercises. In contrast with this volume is a standard text in physics. In a typical chapter, that on the unit "Induced Currents" (the authors have, by the way, used here a teaching unit and not merely a topic), something over one-half the content is devoted to description of the practical appliances which illustrate the unit; but in every case the application of the unit is traced. Hence, these pages become valuable assimilative material. The student can utilize their content as experience out of which the fundamental adaptation arises, and in so doing the appliances themselves become a part of his final intellectual equipment.

Perhaps the most striking example of non-teachable material is to be found in the older texts in history. Nearly all of them were made up of this sort of content from beginning to end. They were chronicles of a meager sort but not histories. They recorded events in chronological order of occurrence, but they failed utterly as a class to interpret the past as an intelligible evolutionary process. There was nothing to be learned because there was nothing to be understood. They were much less valuable than a reasonably veracious and well-written historical novel or drama because they seldom had the literary quality which creates a gripping interest and which makes the mere story of the past useful for appreciation values. A typical text in United States history, for instance, would narrate the long series of events which together make up the topic "Discovery and Colonization," but it would utterly fail to explain discovery and colonization as the intelligible outcome of economic, political, and religious causation.

The normal outcome would be a tedious and scrappy memorization of the accounts of insignificant voyages and of equally meaningless futile attempts at colonization, unintelligible and soon forgotten. Later in the book would appear a meager rehearsal of the campaigns of the Revolutionary War, too meager to capture the attention as examples of heroic devotion; the story of presidential administrations down to the Civil War; then another excursion into the field of military science; and, finally, an unintelligible newspaper account under some such caption as "The Wonderful Progress Following the War." Such great epics as "The Critical Period," "The Industrial Revolution," "The Winning of the West," "The Slavery Issue," and "Foreign Relations" were untouched save as a fortunate pupil might by chance see a meaning in the succession of numbered short paragraphs with which his book was filled.

The typical text in geography was as bad in this respect as the history texts, or worse.

Still another illustration can be found in many of the English and non-vernacular grammars. The lengths to which the logician who is devoted to the deductive method can go have often been exhibited in accounts of the follies of the later medieval intellectuals. Much the same sort of thing is found in the classifications which not very ancient writers of school texts in English grammar have incorporated in their books. Such conceptions as the "copulative" and "substantive" uses of the verb, the "objective" and "subjective" uses of the possessive case, may serve the purposes of refined analysis of the structure of the language, but they are not teachable in the secondary school for the reason that they correspond to no adaptation in the pupil. He cannot use them in criticizing his own use of the language, as he can use, for instance, the principles of agreement between the sentence subject and its verb. These non-teachable distinctions can be memorized but they cannot ordinarily be learned.

The common denominator of all the non-teachable material which we have thus far discussed is found in the principle that it

either cannot be organized into units or is incapable of serving as assimilative material for units which might be organized. Much of it makes interesting reading, just as do the contents of the library shelves or the columns of the daily newspaper or the periodical magazine, but it does not require the intervention of the teacher and the school.

In truth, the number of learning units in the complete horizon of the field of general education which require teaching is surprisingly small. The sum of human knowledge, on the other hand, is too vast for the comprehension of any human being. The objective of teaching in the school is not only adjustment but adaptability, not only putting the youth in intelligent contact with the world as it is but providing him with the cultural tools with which he can and will read the changing face of life. It is pedagogical waste, therefore, to use teaching time and program space for the schooling of the pupil in what he can learn by himself, and especially in what constitutes experience to be attained through reading but not learning in any educational sense.

PART II
CONTROL TECHNIQUE

CHAPTER VII

ESTABLISHING THE LEARNING SITUATION

THE first step in any systematic teaching procedure must obviously be the establishment of a condition in the class group, and in the attitudes of the individual pupils who make up the group, in which the adaptations implied by the objectives of teaching become possible—one in which teaching can register. We shall call such a condition the *learning situation*. The major elements in the learning situation are *motivation* and *attention*. The two elements seem to be mutually related. There is not likely to arise a sustained attention, apart from the establishment of motivation, and conversely no real motivation is possible without the development of capacity for active volitional attention to the subject matter of teaching and study.

I

MOTIVATION.—It is probably safe to say that no actual learning, in the sense of personality adaptation, ever takes place, even under repetitive drill, apart from an inner drive in the direction of adaptation commonly but inaccurately described as a desire to learn.

The normal young of all the higher animals come into the world with the rudiments of such an inner drive in the form of an innate trait which we call *curiosity*. As between individuals there are all degrees in the acuteness with which the trait appears, but, save in abnormal or subnormal specimens, the trait is present as an adaptive characteristic which constitutes the organic possibility of learning at all. Nevertheless, mere native curiosity would not carry the individual child very far on his way to civilization, even though he were consciously placed in the most favorable experiential surroundings. The fundamental social institu-

tion which we call the School owes its origin to the necessity of effective teaching and discipline.

Conversely, we are all born into the world circumstanced by the conditions of our organic nature and one of the most conspicuous of these is *adaptive inertia*, that is to say, resistance to change save as chance wafts of curiosity drive us. In common parlance, we hate to learn, and infinite are the avenues through which we seek to escape and excuse ourselves. An illustration of these attempts to escape is found in the reluctance with which some "modernists in education" accept the principle in question. Instantly, highly exceptional individuals ranging from Manu to Abraham Lincoln are cited in refutation and the inference is placidly set up that the exception is the type. In brief, we all tend to believe what we like to believe.

Hence the critical importance of motivation as a universal principle in teaching and schooling. Motivation is the purposeful establishment on the part of the teacher and the school of a drive toward learning the specific objectives in hand. It is a contest with adaptive inertia on the one hand and with misdirected curiosity on the other.

The process may be agreeable from the pupil's standpoint. In proportion as the fundamental experiences of childhood are sound and rich, and the program of studies is well-ordered, and the volitional development of the pupil is well-achieved, motivation is provided for by superior pedagogical organization and the pupil is unaware of the process.

It may be intensely disagreeable, even to the extent of brute force, and still be motivation. Spoiled Harvey Cheyne dances about the deck and learns the ropes because as between learning and the rope's end in the hands of Long Jack he prefers learning. The sailor overcomes the boy's "adaptive inertia" expeditiously and effectively. Teachers are often so reluctant to contemplate the harsh in life that they resist all acceptance of this fundamental principle. It is a contradiction in terms to assert that attention to subject matter which is initially unappealing is a pleasant ex-

perience, and yet that is precisely what has to be done by all pupils if the learning situation is to be established at all. Somebody, either parent or teacher, has to constrain and compel the pupil to the point at which this adaptation takes place. The pupil must learn this conduct attitude as truly as he learns a unit in arithmetic or one in geography, as truly as he must learn to read.

It follows that the grand strategy of motivation consists in developing the capacity of attention in the class group and of sustaining application to the task in hand in the individual's learning.

INTEREST.—The reader will no doubt associate all the foregoing with the term *interest*. Few words in the language have been more abused.

Interest, pedagogically considered, is strictly the name of an emotional state which accompanies learning. Hence, the effort to make learning "interesting" is to get the cart before the horse. Effective teaching which results in learning is always interesting teaching. It is interesting because it is effective and not effective because it is interesting. In the misuse of terms thus suggested, such words as "appealing," "attractive," "pleasant," "beguiling" might well be substituted for "interesting." The import of the process itself as thus applied is not education but rather advertising or perhaps propagandizing. Unhappily, it is of course very apt to be mere school demagoguery addressed to immature children, a singularly contemptible use of an always-despicable art.

The term is used in quite a different sense in such an expression as "intellectual interest" or "cultural interest" or "business interest." Here the meaning is practically equivalent to "being concerned with" and is indeed close to the meaning of the word in its etymological derivation. Interest in this sense is one of the major educational products. Pedagogically, it is a learning of the appreciation type, that is to say, a value attitude. It appears in the learning process as applied to the mastery of a particular unit as a sense of meaning and "worth-whileness." It implies an emotional condition which may or may not be agreeable in color.

It may reflect willing devotion to toil and hardship and sometimes to experiences which are the reverse of pleasurable.

The course which an individual's learning will take when he has been released from the constraint of the schoolroom will depend upon the character and extent of such genuine interests. If he has acquired no sustained interests, the teaching to which he has been exposed will have failed in its principal objective. If he has become educated in the process of schooling, the fact of his education will be manifested in his willing pursuit of the interests implied by the curriculum and the teaching of the school.

The nadir of educational misapprehension is reached in that theory of teaching which holds that motivation should be founded on naïve curiosity alone and that no learning should be insisted upon save that which is self-motivated. The theory would have some validity if childhood were as long as the whole history of the human race, but hardly otherwise.

II

SUSTAINED APPLICATION.—Hence, from an early period in school life, one of the major obligations of the school is to train the pupil into the capacity of volitional application to learning which in itself has no initial appeal. A pupil so trained becomes capable of developing interest, and consequently sustaining motivation, in most of the learning which a well-ordered school system sets before him. After a period, longer or shorter as the case may be, the remote initial motivation founded only on a sense of duty and volitional application, in many cases but not all, becomes transformed into real, immediate, and sustaining motivation as the subject matter has opportunity to yield its inherent interest. The youth who has become convinced of this principle and has learned to apply it has taken a fundamentally important step on the pathway to volitional maturity. "In many cases but not all," for not all subject matter placed before the pupil and taught never so skilfully and pursued by the pupil never so faithfully is capable of arousing interest in itself. It may be wrongly placed

in the pupil's program of studies, its interest may be incompatible with existing interest, or there may be other inhibitions—some of them removable and others not. The fair presumption for teacher and pupil alike, however, is that the subject matter is normal in this respect and capable of eventually setting up its own motivation. The opposite attitude leads inevitably little by little to self-indulgence and "soft pedagogy."

SPURIOUS MOTIVATION.—Sustaining motivation arising out of genuine interest is a very intimate relationship between subject matter and the learner, and it is obviously the only form which can be depended upon as an element of the ultimate learning products, namely, abiding and general intellectual interest and educational self-dependence. The school in its devotion to lesson-learning and ground-to-be-covered not infrequently sets up spurious motivation, that is, motivation calculated to stimulate the pupil merely in the direction of the successful performance of tasks. The illustrations which will occur to the reader are the passing-grade theory of administrative technique, rank-in-class founded upon artificial marks and grades, and various forms of prizes, honors, and the like. Even the work of the teacher who has the clearest educational insight and the best pedagogical skill is frequently handicapped, if not negated, by the spurious motivation set up under the misdirected efforts of well-meaning but unwise parents and administrative systems. No doubt such spurious motivation occasionally gives rise to genuine and sustaining motivation. Such is very probably the case with the "transfer type" of learner, whom we identified in our study of lesson-learning. Nevertheless, the useful effect is at best casual, and in the majority of cases the removal of the stimulus removes the motivation as well.

The development in the pupil of the capacity for willing sustained application, founded only on the expectation that the subject matter will ultimately yield a sustaining interest, is therefore the foundation of any systematic technique of teaching and learning. It is the starting-point of control technique.

GROUP ATTENTION.—Teaching is, however, as often group instruction as the oversight of individual learning activities. Whenever the teacher has occasion to present a unit to the class group, or to make an explanation, or to conduct an effective group exercise such as is the foundation of operative technique in language teaching, a situation arises in which it is necessary to secure and hold the attention of the group as a whole. Let us call this aspect of the learning situation *group attention*.

Group attention is frequently ignored. Under the influence of the daily-task theory of teaching, the teacher's mind is apt to be fixed upon hearing individual recitations rather than upon teaching. Not unnaturally, he overlooks the importance of securing and holding the undivided attention of every member of the group. The characteristic picture of such a situation is eager attention on the part of a few pupils, occasional attention on the part of a few others, and no attention at all on the part of a large percentage of the class. Obviously, a large waste occurs, and one which is normally related to the lesson-hearing technique. When one has delivered the goods which were called for and has become sensible that they are evidently what was called for, why be concerned while others deliver their own? Observation of concrete cases not infrequently discloses instances of failure to control the group aspect of the learning situation which have reached the logical extreme: a considerable number of the students are reading newspapers. The theory of teaching being what is in such cases, it is entirely reasonable for students to be so engaged. They are utilizing time, which would otherwise be wasted, in keeping up with current events.

Of course teaching can register only with pupils who are mentally attentive, not occasionally but continuously. Hence, neglect of the group-attention aspect of the learning situation means that group teaching has little or no effect. It registers only casually, and its results are seen later in the form of chance distribution of pupil achievement scores. Obviously, mastery need not be looked for in the class as a whole. Nor is it sufficient that the class have

the appearance of attention. The pupils must be listening with their minds as well as with their ears. Spurious group attention is sometimes found in classes which are in control of the martinet type of teacher. The situation is analogous to that of the individual pupil who is under spurious motivation.

The continuous attention which is the condition precedent to effective group teaching we shall call *sustained attention*, and we shall use the term *sustained application* to refer to the similar attitude in the pupil during periods of study or other individual learning activity.

Now, while sustained application is in the main the pupil's own affair, sustained attention requires the mental participation of both teacher and pupil. In sustained application, the pupil learns to apply himself to the study in hand, with such help as he can get from the teacher, or he fails so to learn. Sustained attention, on the other hand, requires not only a willing and attentive pupil but an intelligible and forceful teacher, conscious of the necessity of keeping every member of the class group within the reach of a compelling personality. Nevertheless, forceful and intelligible teaching is still only one of the two factors at work. The other is training the pupil into the capacity of assimilative listening to the spoken word just as in study he is trained into assimilative reading of the written word. To this extent, the same principles apply to the pupil's sustained attention which apply to his sustained application. To neglect this aspect of pupil training is again for the teacher to allow himself to fall back on the precepts of soft pedagogy and to secure group attention by merely making the subject matter he presents "interesting."

III

CONSEQUENCES OF POOR CONTROL.—May we turn now to some of the consequences of poor control technique and by implication to some of the advantages of good control.

It is obvious, in the first place, that good control technique and the elimination of waste are intimately related. Since learn-

ing is wholly dependent, other things being equal, on the character and amount of attention secured, the amount of learning possible in a given time tends to be directly proportional to the degree of control technique secured in the course and in the school. Conversely, if we establish actual mastery as the standard of attainment, the time required is in part a function of the control technique. If, for example, a given school maintains a consistent average of 50 per cent control as compared with another which on the same basis of rating yields a consistent average of 75 per cent, plainly the second school should accomplish in two years that for which the first requires three years, other things being equal.

The waste-in-time consideration is not important in schools which are conducted on the time-to-be-spent theory. These schools arbitrarily define education in terms of time-to-be-spent—four years constitutes a high-school education, four years a college education, and so on. There can be no waste in time, for time is arbitrarily fixed for all. Waste is therefore expressible in terms of humanity which fails to learn. In such schools, good control technique means thrift in the use of human lives—a relatively low percentage of failure.

If, on the other hand, we set up definite objectives of teaching in the form of mastery of definite learning units, then the matter of control technique comes to be of critical importance. With a low degree of group attention and the pupils left indefinitely without the trained capacity for sustained application, mastery may well be indefinitely deferred.

NEEDLESS SPREAD OF CLASS IN LEARNING RATE.—The problem of administrative technique which perhaps calls for more attention than any other in current practice is that of the spread of the class group in learning rate. The determinist accepts this as inevitable and founded on inherent differences in capacity to learn. He accordingly seeks to discover a homogeneous group by dint of discovering, through tests of various kinds, individuals who are of approximately the same inherent rate of learning. He

achieves some success in putting together individuals who are of the same type of conformity to the technique in vogue, usually the daily-lesson procedure.

That individuals do differ in rate of learning in manifold ways is beyond question, but many of these differences are founded on characteristics which are remediable. Conspicuous among these latter are differences in sustained attention and sustained application. The teacher who tolerates day after day a spread in attention from perfect attention to no attention at all and who accepts a dawdling pupil with the fatalistic verdict, "He cannot concentrate," must expect a spread in the class group which makes any effective teaching of the group as a whole well-nigh impossible. A high grade of control technique, say 90 per cent or over, as a matter of fact, other things being equal, greatly reduces the spread, and we can readily see why it is so. In the first place, teaching registers with the whole class instead of only with a part of the class; and in the second place, true motivation is much more likely to characterize the class as a whole than the casual few individuals only.

HALF-LEARNING.—Low control technique means that there will be a large amount of half-learning in the class, much of which may escape detection in the presence of any tests which can be given. A certain type of pupil acquires remarkable facility in catching enough of the drift of things, by occasional momentary periods of attention, to present the appearance of learning. Unless the testing is especially acute and rigorous, the superficial character of his learning escapes detection only to form a handicap in later units and in later courses—a handicap to the school because he will later require much reteaching and a handicap to him not only in school but in later life because of the habits of superficiality which have become established.

NEEDLESS RETEACHING.—In practice, under mastery teaching, poor control shows its chief wasteful effect in the amount of reteaching required. The brilliant half-learner may escape reteaching for the moment, but the bulk of the class which has been

only half-attentive or altogether inattentive fails in the teaching test and very probably after a second, third, or fourth teaching. The effect often is to create the impression of inferior learning capacity when in reality the ground of poor learning is to be found in poor control technique.

IV

CONTROL TECHNIQUE AS AN INDEX OF THE TEACHER'S CAPACITY.—An important corollary of all the foregoing is the principle that his control technique is a good fundamental index of the teacher's capacity as a classroom technician. However valuable may be the material which the teacher has to present, he cannot make it register with his pupils, and establish in them the learning products which he seeks, unless he can and will secure and hold their sustained attention and, in the secondary school at least, develop in them the capacity for sustained application. The teacher's control technique is as important as his operative technique. No teacher who assumes to approach his task in a constructive spirit, and who is to be credited with the educational point of view, can dismiss the matter from his mind with the trite comment, "These pupils have failed because they are inattentive." That is the lesson-hearer's theory of teaching. He can more correctly say, "I have failed with these pupils because I have been unable as yet to develop in them the capacity of sustained attention and sustained application."

On the other hand, it should be noted that, while poor control technique always means poor teaching, good control technique does not necessarily mean good teaching. The material itself may be unsuitable and even false. It may be wrongly placed in the pupil's program of study. The teacher's operative and administrative technique may either or both be such as to lead to failure to make the teaching register in the learning products intended. Control technique is of primary importance but not necessarily of chief or ultimate importance.

Lest the supervisory officer be misled by attracting his atten-

tion to the use of control technique as a means of rating teachers, a cautionary statement is not out of place. Any supervision which is worth the while is constructive supervision. A supervisor who uses this or any other device for rating teachers, simply as a means of detecting and eliminating the inefficient, is adopting the lesson-hearing attitude in his relation to his teachers which he should be endeavoring to root out in their relations to the pupils. A supervisor who has not the educational point of view is not likely to develop that attitude among his teachers. Just as the sustained-application profile of the pupils described in chapter ix is the first step in building up the pupils' volitional attitude toward their studying, so the group-attention analysis and score described in chapter viii should be used primarily for the purpose of attracting the attention of teachers concretely to the obvious need of good group control and for the purpose of assisting them to improve their practice. Any supervisor who will analyze and score his teachers' group control, and will then discuss with them collectively and individually the bearing and significance of the whole matter, will be gratified by the improvement which he will see taking place. Of course, a mature person who fails to improve his teaching, in either this or any other respect, on account of either inability or contumacy, should be eliminated from the teaching force. Society cannot afford the elimination of potentially good teachers, nor, on the other hand, can it afford the retention of persistent "problem cases" in the teaching force.

V

OTHER ELEMENTS IN THE LEARNING SITUATION.—In tracing out elements of the learning situation which are associated with training in volitional attention, we have of course emphasized these elements, perhaps to the point at which the reader may conclude that attention and the sustaining motivation which grows out of it are the only elements. This is far from being the case. Among other elements which are related to control of the learning situation rather than to the effects of good operative tech-

nique, the following may be enumerated. It will be noted that they are chiefly the removal of inhibitions.

REDUCTION OF MECHANICAL DETAIL.—Of these, perhaps the first in importance is the reduction of the mechanical detail of classroom management to the minimum. If we score the group attention from the moment when the study or the teaching period is supposed to begin to that at which it is supposed to end, we frequently come upon cases in which control is nearly perfect during actual teaching or study time while the final score is low owing to waste of time in taking attendance, in entrance and dismissal of the class, and the like. It is very easy to lose ten minutes out of every class period in this way, and this loss may amount to anywhere from one-sixth to one-third of the whole learning time available.

PHYSICAL CONDITIONS.—Control technique implies control of the physical conditions under which learning goes on. Temperature and humidity will often make the difference between a score which reflects attention of high quality and an equal score which is associated with attention of poor quality. Similarly, street noises, disturbances in corridors and adjacent rooms, and the like furnish the conditions under which the good effects of good control are partially or wholly lost.

GOOD ORDER.—It is of course a great mistake to think of good control technique as practically synonymous with the securing of good order. We have seen that the martinet frequently succeeds merely in securing spurious attention. Nevertheless, due respect for the teacher, for the class, and for study is an essential element in the establishment of the learning situation and a major problem of effective control technique. Noisy, disorderly, subordinate conditions in the class represent the weeds and rank primitive growth which must be extirpated before it is worth while to begin the process of cultivation. In a thoroughly good school system, this aspect of the learning situation is established in the primary social adaptations. Even in such a system, however, the influx of children from other communities is apt to

make the primary education a matter of continuous concern. There are two positions commonly held on this issue which must be met.

One is that of the slack teacher and demagogic school executive who talk plausibly of democracy and of the vice of repressive measures. This attitude can usually be identified as pure defense of disciplinary ineptitude or job-holding proclivities, and it is not entitled to serious argument. Suffice it to point out that it is full of peril to real democracy in a period when there resort to the secondary schools multitudes of children who are growing up in the indolent homes of the unduly prosperous, or in immigrant homes in which the restraints of Europe have been relaxed without replacement by the wholesome restraints of America.

The other position is in essence that children learn from experience and that self-government can never be achieved in any fundamental and lasting sense except as children learn it for themselves, apart from compulsion. The premise is undoubtedly sound, but the conclusions which are often drawn are fallacious. It is true that children who are merely kept in good order by force of a dominating personality and an arbitrary school government are likely to leave school with few wholesome learning products of a volitional sort established. It is, on the other hand, probably true that if children were left to themselves to do as they pleased in each generation, society would soon revert to its primitive condition, since it would become impossible to accumulate from generation to generation the appropriate social controls. Children and youth learn from experience, and they are not likely to learn the blessings of good order unless they can experience good order. Such experience comes normally out of rational obedience to the older generation. If the older generation, whether parent or teacher, gets no farther than the maintenance of obedience as a tribute to its own self-love, only the docile and unventuresome will profit, and these only in a spurious and undesirable fashion. If it convinces the youth of the neces-

sity and dignity of good order, even though it be through the exacting of obedience, it achieves a real educational product.

PUPIL IDEATIONAL AND EXPERIENTIAL BACKGROUND.—A vital element in the establishment of the learning situation is the rounding out and correction of the pupil's ideational and experiential background. It has nothing to do with control technique, and it is noted here merely to get the element into the picture of the learning situation. The reader will find further discussion in chapter x under the caption *Apperceptive Mass*. It is beyond the control of the classroom teacher and beyond the full control of the executive management of any particular school. It is a problem of the school system as a whole; and, as I think, of the state system and even the national system. Locally, responsibility resides in the superintendent of schools.

CHAPTER VIII

MEASURING GROUP CONTROL

IN order to secure a concrete basis for dealing with control technique in a constructive manner, it is evidently desirable to find some means of measuring and exhibiting sustained attention in the group and sustained application in the individual pupil. To this purpose the present chapter and that which follows are addressed. Since the practicing teacher can hardly undertake the fundamental problem of developing individual sustained application until the class group as a whole is under control, we shall find it advantageous to deal with the latter aspect of control technique first.

The problem reduces itself to finding some way in which the aggregate pupil-minutes of attention in a given class period can be counted. If we attempt to refine the process to exact terms expressed in seconds and to take into account actual fluctuations in the individual pupil's attention as they appear in the stream of consciousness, we shall find ourselves so bound down to the methods of the psychological laboratory as to be able to make little progress in dealing with the actual classroom situation. We can, however, set up a method by which useful approximations can be secured, measures more useful for our present purpose than would be refinements which cannot be used in teaching practice at all and which, if they could be used, would probably add little for the purpose which we have in mind.

I

THE MINUTE-BY-MINUTE SCORE.—We can perhaps best begin by noting the number of pupils in a group who are apparently attentive, minute by minute, during a class period.

The observer takes a position near the front of the room so

placed that he can look into the faces of all the pupils and at the same time be himself out of the natural line of their vision. It is essential that the class shall not to any considerable degree be curious about the observer to the extent of directing attention upon him and his activities. To this end, it may be necessary to experiment in several different meetings of the same group or until the pupils become accustomed to the presence of the observer. More often, the observer will need only to wait until the pupils' first curiosity has been satisfied and their minds have resumed normal activity. In this case, he can usually get a fairly satisfactory score for the latter part of the period. If the class evidently does not become accustomed to the presence of the observer, the record should be thrown out.

An appropriate situation having been established, the observer notes minute by minute the number of pupils in attention. It is convenient for this purpose to have a simple record card so fastened to a tablet that it can be laid on the lap, or on the arm of a chair, in such a manner that the observer can record with his right hand while holding a watch in the left. A sample scoring is shown in Table II.

In this case the observer began on the stroke of the bell to count pupils in attention. At 10:01, he was ready to count again and so continued until the end of the period. Scoring is not ordinarily done in this somewhat meticulous fashion. The minute-by-minute score has the advantage of greater precision, and it is well for the beginner to practice with this form until he secures facility. Much the same result can be obtained by scoring at two- or three-minute intervals, averaging the results, and multiplying by the total elapsed number of minutes in order to derive the total pupil-minutes attention.

A minute is a very considerable interval of time, and the fact becomes impressive when one is observing a class with occasional glances at the second-hand of a watch. Even during a single minute, a given pupil may be in and out of apparent attention several times. The pupil who is really attending to business, however,

TABLE II

Number in the class.....30		Pupils in Attention
Period begins.....10:00		6
	01	6
	02	6
	03	6
	04	6
	05	6
	06	6
	07	7
	08	9
	09	16
	10	25
	11	27
	12	28
	13	28
	14	28
	15	28
	16	28
	17	24
	18	23
	19	20
	20	20
	21	20
	22	20
	23	19
	24	18
	25	17
	26	16
	27	30
	28	30
	29	30
	30	28
	31	24
	32	20
	33	16
	34	13
	35	8
	36	6
	37	6
	38	6
	39	6
	40	6
	41	6
	42	7
	43	8
	44	6
	45	6
	46	6
	47	30
	48	30
	49	30
Period ends.....10:50		
Number of minutes.....50		
Possible pupil-minutes attention:		
$30 \times 50 = 1,500$		
Actual pupil-minutes attention.....	821	
Percentage of attention.....	55	

remains in that state over several minutes at least, and the observer soon learns to count the pupils who exhibit the characteristics of attention rather than the mere momentary physical fact of apparent attention.

WHEN IS A PUPIL IN ATTENTION?—The question at once arises, When is a pupil in attention? The observer must practice with classes until he can answer the question for himself and rapidly note the attentive pupils without arousing in his own mind debate as to whether a given pupil is or is not in attention. He will find before long that he has attained considerable confidence in the snap judgments which he must thus make. In the ordinary class there are usually found three kinds of pupil situations with respect to our problem.

The large majority of pupils who are inattentive are obviously so. They are looking out of the window, conversing with neighbors, engaged in arranging their toilets, obviously dreaming, doing something which is clearly not connected with the work in hand.

Most of the pupils who are attentive are again obviously attentive. Eyes, physical posture, activities, leave the observer in no doubt. Everything speaks of the mind which is focused upon the work in hand, whether it be an explanation which is being presented by the teacher, the recitation of a fellow-pupil, or a piece of study upon which the pupil is himself engaged. These pupils of course represent the standard to which the group as a whole must be brought.

The observer's principal problem is with a third group, the pupils who are "listening with their ears but not with their minds." These pupils range from the prim little girl who sits erect, in perfect decorum, ready to react to any obvious stimulus, such as a question put by the teacher, to the lounging boy with head on hand sprawled over the top of the desk whose hand moves listlessly and automatically whenever others' hands move. In sorting out the really attentive from this group, the observer will learn to depend much more upon his own experience than

upon any precepts which can be laid down. Certain guide-marks can, however, be suggested.

In the first place, in all but a few exceptional cases, the attentive child or youth has a characteristic physical attitude. His feet are usually drawn up beneath the chair, head slightly inclined forward, the whole body tense rather than relaxed. As the play of the mental situation develops, from the alert teacher to the responses of another pupil, eyes, head, and whole body follow the movement.

The almost infallible index of attention is the eye. Would that we could describe in precise terms the characteristics of the eye expression which tells of the alert and attentive mind! We can only advise the observer to note, confident that a brief experience will enable him to identify the signs with a degree of assurance which will give abundant help in arriving at a reliable approximate estimate of the amount of sustained attention found in a given class period.

If the obviously inattentive and the obviously attentive are first counted and then the two rules which have been suggested are applied to the doubtful cases, there will be little of the element of uncertainty left in the measure. There will be some. A certain type of pupil wears an inexpressive face. If he is not obviously inattentive, it is hard to tell whether or not he is attentive. Neither his physical attitude nor his eye carries conviction to the observer. As the period draws on, however, such a pupil often sooner or later gives clear evidence whether or not he has been attentive, and in that case the score can be corrected. If a need is felt for the greatest possible precision in scoring—and this is usually the case when scoring is being done for investigational purposes—these uncertain individuals can be excluded from the counting altogether and due note made of the circumstance.

THE TEACHER'S MISCONCEPTIONS.—In considering a class score with the teacher, the supervisor will frequently be met with a statement which runs something like this: "I note that you

have rated A as inattentive because he was looking out of the window. Now that is his way, but he is paying attention just the same, for he always answers correctly when I ask him a question." The issue comes upon the teacher's phraseology, "paying attention." The period is usually a lesson-learning situation and A has learned how to keep the general situation always in the margin of consciousness sufficiently well to enable him to pick it up at need with little lost motion. There is, however, a vast difference between "paying attention" and that focal attention to material which is being presented by the teacher or the textbook which is the essence of the learning situation.

ATTENTIVE TO WHAT?—"When is the pupil attentive?" suggests "attentive to what?" In general to any situation in respect to which the observer wishes to measure attention. It may be a study period, a presentation or explanation, a class discussion, or a class period as a whole. In systematic supervision, the last is properly the object to be measured, but with discrimination.

Good control technique presumes sustained attention to the work in hand, from the moment when the opening bell rings until that at which the closing signal is given. Nevertheless, it should be borne in mind that it is teaching technique which we are measuring and not merely the pupils' occupation. If a study period is evidently expected, then the object of attention is study. If the teacher is making a presentation to the class, presumably he requires the attention of the class to his words. If a pupil in that case keeps on studying, he is out of attention, even though he may be engaged in profitable study. If the work in hand is a recitation, it is presumably conducted on the theory that it is serviceable to the class as a whole; therefore a pupil who is attentive to something else than the recitation is out of attention.

PURPOSE IN COLLECTING SIGNIFICANT FACTS.—The observer who has been long accustomed to the mechanical administrative technique which is so common a feature of schoolroom practice is apt to approach the task of measuring educational products under the obsession of various stereotypes, which have

become established in a process of scoring and grading and crediting persons rather than things. The questions are ever to the foreground in his mind: "Is this score just to the pupil?" "Is it fair to the teacher to include that incident?" "Must I not omit this interruption in order to be fair to the principal?" It is essential that all such stereotypes be destroyed. The purpose of measuring and recording is a veracious picture of an actual objective situation. There is no question of justice as between individuals in the matter. The personal element is in the observer's mind because it has been placed there by an utterly false and mechanical theory of education and of teaching, namely, that the whole problem of teaching is the award of credits to individual pupils and that the nature of education is the accumulation of a standard number of such credits. In measuring group attention, the observer has before him the simple problem of estimating accurately, and as precisely as circumstances will permit, the actual situation before him, personal implications of every sort whatsoever being for the moment completely ignored.

RELIABILITY.—How reliable is the score thus found? That is to say, How closely will two equally competent observers agree in their final estimate for the same class situation? It may be stated in passing that the process is not one of precision, and consequently absolute agreement between the scores of two observers is out of the question. If such occurs, it is to be attributed to accident.

The minute-by-minute score is more precise and consequently more reliable than the analytical score by phases described below, although the latter is far more useful for practical purposes.

In a group of, let us say, forty observers, all of them novices, there will usually be perhaps half-a-dozen individuals whose scores are markedly eccentric, deviating twelve to fifteen points on the percentile scale from the median of the group. With these exceptions, the scores of individual observers rarely deviate more than five points from the average of the scores of the group of observers. The agreement is commonly within a range of less

than ten points between the extreme estimates. Classes with scores of about 80 per cent to 100 per cent and those which show scores of less than about 50 per cent can seemingly be estimated with more confidence than others. The reason is obvious. The higher scores include many individual pupils who show consistent sustained attention, and the lower scores many who show consistent inattention. The middle scores include a great deal of fluctuating attention which is harder to count. Translated into common parlance, we may say that a computed score of, let us say, 80 per cent may correspond to an actual score of 75 per cent or 85 per cent, but we can feel sure that the actual score is not 90 per cent nor yet 70 per cent.¹

II

LEARNING THE SCORING TECHNIQUE.—In learning the technique, observers should practice in groups if possible until facility has been developed and until eccentric scoring has been eliminated. For example, a city district superintendent can call his school principals and their supervisory staffs together and set them to self-training. Similarly, in a survey, the groups of observers who are to do the class scoring should be submitted to a period of practice until their scoring becomes homogeneous. In the process of such practice, the personal equations of the several observers will tend to develop. That is, some individuals will be found to make consistently low and others consistently high estimates. The period of practice draws to an end when in the observing group different individuals find their places in the following manner. In the first few observations, observers A, B, C,

¹ Bjarnason reports a Utah test in which the scoring of thirty different principals, supervisors, and superintendents as applied to twenty-nine different teachers was compared with his own scoring of the same teachers. The coefficient of correlation was found to be .86 and the probable error .033. There were four eccentric scorers, but even including the latter the average difference between the two sets of scores was but 2.1 points on the percentile scale.

Bjarnason, *A Study of the Relation of Technique of Instruction to Control Technique*, 1927. Utah Education Association, 316 Vermont Building, Salt Lake City.

D, E, and F will probably distribute themselves from highest score to lowest somewhat as follows:

1. B—C—E—A—D—F
2. A—D—F—E—B—C
3. D—F—B—A—E—C

This distribution is eccentric and shows that the learning process is still going on. On the fifth, sixth, and seventh observations, however, the distribution may appear more as follows:

5. D—F—A—B—E—C
6. D—F—A—E—B—C
7. D—F—A—E—B—C

The indication is now that the several observers have found each his characteristic individual scoring tendency, and the period of practice can be brought to an end. After some further experience, the personal equation of each observer can be approximated statistically if desired and his scores correspondingly corrected.

Lest the suggestions just made should discourage the principal or superintendent who has no supervisory staff and who is remote from fellow-workers, attention is called to the principle that objective precision here is not a matter of first importance for the constructive use which may be made of group-attention measurements. Constructive supervision has to rely chiefly on comparisons. A given score is not in itself so important as is the relation which it bears to earlier and later scores of the same class group. When the same observer makes both scores, the chances are that he will tend to make the same error in one as in another, and in a comparison these errors will largely or wholly neutralize one another.

III

PHASE SCORING.—The minute-by-minute score is of little use when it is desired either to study the influence of different devices upon class attention or to help the teacher to build up a satisfactory control technique. For such purposes, it is desirable to break

up the class period into phases, note the character of each phase and the fluctuations of attention from phase to phase. The method is illustrated by the reports of actual observations listed in Table III.

Case II gives us an excellent illustration of the use of the class-attention analysis for purposes of constructive improvement of control technique. The attention is very good compared with the 40 per cent, 30 per cent, or even 10 per cent which we frequently find, any one of which is of course practically equivalent to no attention at all. But the control technique reported in Case II is easily susceptible of improvement, and we can readily see wherein.

In the first four minutes we find a clumsy management of mechanical detail. The papers might have been on the desks when the class entered and a single announcement made to serve. Further, in Phase I the instructor accepts inattention from 8 pupils, or rather does not succeed in attracting their attention. Out of these three phases, we get thirty-five pupil-minutes attention when we should have obtained ninety-two.

The entrance of a late pupil breaks down attention for one minute. This is not nearly so bad as is frequently the case, but the pupils should be trained not to permit attention to be distracted in this manner. We lose eight pupil-minutes here.

The second set of papers, like the first, should have been ready on the desks and properly protected from premature inspection. We lose twenty-four pupil-minutes.

In Phases X and XI, we note a total loss of forty-three pupil-minutes. Very possibly the attention could not profitably have been saved, but the score for these phases at once brings the technique into question.

SCORING A LONG PHASE.—It will be noted that in a relatively long phase, like IX in Case II, a single figure is given as the count of the number of pupils attentive. The figure is theoretically the average number of pupils in attention during the phase. In precise scoring, the observer makes a minute-by-minute count

TABLE III

Case I. *Mathematics* (last 30 minutes of a 50-minute period)

	10'	9'	5'	4'	2'	
	28	30	30	30	30	
30	I	II	III	IV	V	=98 per cent

Analysis by phases

- I. Supervised study
 - Inattention caused by whispering
- II. Explanation by instructor
- III. Problem solving
- IV. Discussion
 - 7 pupils asked questions
 - 2 pupils made suggestions
- V. Explanation of problem by pupil

Computation

Number of pupils—30

Phase I—Pupils attentive, 28. Time elapsed, 10 minutes

$$28 \times 10 = 280 \text{ pupil-minutes attention}$$

Phase II— $30 \times 9 = 270$ pupil-minutes attentionPhase III— $30 \times 5 = 150$ pupil-minutes attentionPhase IV— $30 \times 4 = 120$ pupil-minutes attentionPhase V— $30 \times 2 = 60$ pupil-minutes attention

Total pupil-minutes attention=880

Total possible pupil-minutes attention, $30 \times 30 = 900$

Percentage of attention=98

Case II. *Social science*

	1'	2'	1'	3'		1'	7'	4'	1'		14'	5'	11'	
	15	0	20	23		24	15	23	23	0	23	23	21	20
23	I	II	III	IV		V	VI	VII	VIII		IX	X	XI	=88

Analysis by phases

- I. Announcement
- II. Passing out test papers
- III. Further announcements and settling down to business
- IV. Work on tests
- V. Belated pupil enters

TABLE III—*Continued*

- VI. Work resumed
- VII. Papers exchanged, graded, and handed in
- VIII. More test papers distributed
- IX. Work on papers; pupil leaves
- X. Papers exchanged, graded, and handed in. Another set distributed and announcement made
- XI. Consultation and work on papers

Computation

Total Number of Pupils:

23 for 7 minutes

24 for 13 minutes

23 for 30 minutes

Phase I—Pupils attentive, 15. Time elapsed, 1 minute

$$15 \times 1 = 15 \text{ pupil-minutes attention}$$

Phase II—0 × 2 = 0 pupil-minutes attention

Phase III—20 × 1 = 20 pupil-minutes attention

Phase IV—23 × 3 = 69 pupil-minutes attention

Phase V—15 × 1 = 15 pupil-minutes attention

Phase VI—23 × 7 = 161 pupil-minutes attention

Phase VII—23 × 4 = 92 pupil-minutes attention

Phase VIII—0 × 1 = 0 pupil-minutes attention

Phase IX—23 × 14 = 322 pupil-minutes attention

Phase X—21 × 5 = 105 pupil-minutes attention

Phase XI—20 × 11 = 220 pupil-minutes attention

Total pupil-minutes attention = 1,019

Total possible pupil-minutes attention $23 \times 7 = 161$

$$24 \times 13 = 312$$

$$23 \times 30 = 690$$

 1,163

Percentage of attention = 88

in one of these long phases. In practice, however, it is usually possible, in a phase of moderate length, to determine the attentive pupils by inspection, for in most cases a pupil who is attentive during part of such a phase will be attentive throughout. The

observer should keep his mind focused on the essential issue, which is in substance, "Is a given pupil attending to business?" With this issue in mind, it will quickly become apparent that certain pupils are attentive and these can be dismissed from constant observation, leaving the observer free to study the behavior of the inattentive and the uncertain. After some practice, it is usually possible to estimate closely the average number of attentive pupils during a phase of considerable length, without making a minute-by-minute score.

IDENTIFICATION OF PHASES.—Division of a class period into phases is largely a matter of the kind of analysis desired. In Case II, the observer has apparently identified all the phases. Another might have combined I, II, and III, and VII and VIII, so that there would have been a total of eight phases instead of eleven. If the count is accurately made, however, the final score will not be affected by the phases selected.

Ordinarily, the phases select themselves, but it sometimes becomes desirable to break up a long phase for special reasons. This is particularly true when the observer notes a sudden fall or sudden rise in attention. For instance, if we regard the period subjected to the minute-by-minute count shown on page 123 as a single long phase, such as a study period or a lecture, it at once becomes apparent that there are four well-marked phases—one ending with the eighth minute, one with the thirty-fourth, one with the forty-sixth, and one with the end of the period. When such pronounced fluctuations in attention occur, it is of course desirable to know the cause.

IV

USE OF THE SCORING.—Let us now give some further consideration to the use to which sustained attention scoring, and particularly the period analysis by phases, can be put.

In the first place, the minute-by-minute score, or some suitable modification thereof, gives us a good starting-point for estimating the teaching technique of different teachers. In this sense, it is a

device which can effectively be used in school surveys. There is good correlation between the teacher's control technique and his gross effectiveness as a classroom technician. It is fair to assume that the teaching in a large school or in a city-school system which is associated with consistently low or erratic attention scores is probably less effective than is the teaching in another system or school which is associated with consistently high attention scores.

It is fair to assume that a given teacher who has consistently poor control technique cannot be an effective teacher, but it does not follow that a teacher who has uniformly good control technique is therefore a good teacher. The attention may be spurious. The operative technique may be so defective in principle that the teacher is doing more harm than good. Even the subject matter may be false.

The supervisory officer can use his attention scores as one means of locating trouble. If progress is slow under a given teacher, if many reteachings are required, if a disproportionate number of failures occurs, the supervisor may be able thus definitely to locate the cause. If the control technique is poor, we have found the point at which correction should begin. If control technique is apparently good, the quality of attention comes in question. Is attention genuine or spurious? If control technique is good and attention of good quality, we have at least eliminated one major field of possible defects.

In the case of teachers whose control is good, the period analysis gives us a means of locating the weak points and bringing control close to 100 per cent.

In the case of teachers whose control is poor, simple exhibition of the results of a period analysis will usually start the process of improvement. The supervisor will repeatedly encounter teachers in whose cases an exhibit of a period analysis will be the first intimation they have ever had that control technique is a vital factor in effective teaching. Improvement is ordinarily immediate and marked, and the teacher becomes interested in subsequent scorings, which can be made either by the supervisor or by a

fellow-teacher. Conversely, consistently low scores studied in connection with the teacher's personality will sometimes prove to be convincing evidence to the teacher himself that he has mistaken his calling.

The wise, and perhaps somewhat cynical, administrator distrusts the "popular" teacher, and it is hard sometimes to secure good evidence of the difference between popularity which is wholesome and well founded and that which amounts only to an unworthy appeal to the prejudices of immature pupils. Let us take two such teachers and secure a series of group-attention scores from an observer who is reliable, impartial, and for whom the pupils will not be on their best behavior. In both cases we find good scores while the teacher is present, but in one case the score is equally good when the teacher is absent while in the other work is laid aside as soon as the teacher is out of the room. One teacher is educating; the other is not.

The same procedure will serve as a typical method of discriminating between the educators, and the non-educators who are not suspected of being popularity hunters but on the contrary are known to be martinets. Attention scoring when the teacher is out of the room gives us a good fundamental index whether or not any transformation is being wrought in the pupils. If the class consistently shows a high score when the teacher is present and the attention falls greatly when the teacher steps out, we may well doubt that any of the teacher's work is generating the true learning products. Here are a few notes from observations:²

Case 1.—The most interesting phases of this period were the third to the eighth where the attention was practically 100 per cent. Five pupils remained with their books as if they did not want to leave them even when the bell had rung dismissal.

Case 2.—Teacher was one minute late—attention, 0. Attention, Phases II–VI, 100 per cent, 100 per cent, 90 per cent, 90 per cent, 90 per cent. Phase VII, teacher leaves room for one minute—attention, 80 per cent. Phases VIII–XI: attention 100 per cent.

² These are not the same cases as those which appear on pages 131–32.

Case 3.—Phase I: Teacher gave directions for writing essays and suggested topics. Left the room at 8:10. Attention, 100 per cent. Phase II: Continued writing essays. Attention, 100 per cent. Phase III: One boy consulted dictionary. He and another conversed for three minutes. Attention, 89 per cent. Phase IV: Boy borrowed paper. Attention, 94 per cent. Phase V: Teacher returned at 8:40. Attention, 100 per cent.

Case 4.—Phases I–III. Confusion in getting settled. Attention, 0–50 per cent. Phases IV and V: Better order but conversation still continued. Attention, 87 per cent and 94 per cent. Phases VI and VII: Attention, 69 per cent. Phases VIII and IX: Teacher leaves room for eight minutes. Attention, 37 per cent and 25 per cent. Phase X: Teacher returns. Attention, 100 per cent.

The foregoing paragraphs will serve to illustrate the many uses to which scoring the group control can be put in the direction of inspection and constructive supervision.

V

BUILDING UP GROUP CONTROL.—We should not close this chapter without suggestions to the teacher of means through which group control can be built up. The suggestions do not imply that any person who happens to occupy the teacher's chair can take the list, go through the motions of applying them, and be assured of success. Success depends upon the insight, the willingness, and the perseverance of the teacher. The suggestions do represent a series of principles which a teacher who possesses the qualities just named can apply with assurance of improved group control. Each of them is the product of observation of many class periods and analysis of the results.

First in importance is the fundamental matter of direct teaching as contrasted with lesson-hearing. A class in the lesson-learning situation is obliged to rely for its motivation upon fellow-pupils rather than upon the teacher. In the nature of the case, the instances are rare in which the reciting pupil can have anything to say to which the class as a whole can yield genuine attention. At the best, the class can only be brought into an attitude

of critical attention to the merits of what the fellow-pupil gives forth, and, since by the fundamental hypothesis of the school all are still learning, it cannot be presumed that the class as a whole is in the intellectual position which makes criticism valid. As a matter of fact, except in rare instances, the critical comments of fellow-pupils are limited to a few individuals, and these deal much in guesswork. A strong and masterful teacher can of course develop the passive, spurious type of attention.

The physical circumstances of the classroom as we have seen have much to do with group control. Poor light and heat, often within the control of the teacher, creaky and noisy furniture and outside disturbances which are within the control of the management if not of the teacher, all make good group control difficult if not impossible.

The arrangement of pupil positions in the room seems to have a singular influence on the possibility of good control. The ordinary rectangular arrangement, in which the normal lines of vision of the pupils do not focus on the teacher's position, tends to center the teacher's effort on those directly in front. In some cases, scrutiny of the lists of failures in a school has disclosed that there are likely to be, other things being equal, distinctly more failures in the cases of pupils who are seated along the sides and in the corners of a wide classroom than among the pupils who are seated directly in front of the teacher. A circular placing of pupil positions, such that the natural lines of vision of all pupils focus on the teacher's position, appears to be a distinct help in the direction of good group control.

Observation shows very clearly that when the teacher knows his subject and has a definite message for the class good group attention usually results. The contrast is found in classes in which the teacher is confined to the textbook, and especially in classes in which the teacher deals largely in leading questions. Theoretically, the lecture method is bad and class discussion based on suggestive questions is good. Practically, a talk by the teacher which is tantamount to a lecture usually secures a hear-

ing, provided it is clear, forceful, to the point, and not too long; while suggestive questioning is usually associated with a low attention score. In the one case, the pupils have something to learn; in the other, the situation is either threshing over old straw or else appealing only to those who have already developed an intellectual interest or are concerned about their marks. Nothing is more banal than the "thought-stimulating" question when the pupil has nothing to think about.

The teacher who has any teaching power at all usually succeeds in securing sustained group attention when he talks to the class. Many a teacher who might become an effective technician fails in a presentation, explanation, or class exercise, because his mind is upon subject matter and not upon his pupils. The observer can identify such practice, in much the same manner in which he identifies the genuinely attentive pupil, by watching the eye and expression. The "lecturer" has a far-away expression, he may look toward his class but the pupils are plainly in the margin of consciousness, his gaze is frequently averted altogether. On the other hand, the teacher who really has a message to deliver has a kindling eye and tense physical expression. He brings the whole class within the power of his message. He is obliged to exert a great deal of energy, and the process is an exhausting one. The teacher who is not physically tired at the end of the day may well doubt that he has done any teaching.

Closely related to the teacher who has his mind upon subject matter is the individual who has his mind upon himself. Now teaching, whether it is in the form of awakening the minds of high-school pupils to a given piece of understanding or appreciation or of convincing an audience of the truth of a proposition, or of selling a customer a bill of goods, implies the vigorous projection of personality. The audience becomes convinced because the speaker is convinced. The observer will find it hard to identify the egoistic teacher on such vague guidance as is implied in the foregoing characterization, but we can be more concrete. Such a teacher, if observed at some length, will usually resort to sarcasm

at times. A different variety of the same fundamental type is the teacher who conducts a continuous vaudeville performance in the classroom and thereby secures a high spurious attention. A third variety is that insufferable menace, the popularity hunter. We are by no means indulging here in mere condemnation. The instances which we have cited are valuable in the present connection only as positive symptoms of an underlying personal attitude which is seldom associated with good teaching or the capacity of maintaining a high degree of sustained genuine class attention, and which can often be corrected by the supervisor who knows how to handle men and women.

Particularly during the supervised study period, good group-control technique depends upon good foremanship, that is, upon the ability of the teacher to so organize procedure that the major elements of waste will be eliminated. A supervised study period frequently shows long queues of pupils waiting to consult the teacher, or a waving forest of the hands of pupils who are endeavoring to attract the attention of the teacher to their more or less imaginary needs. These are illustrations of bad foremanship. Such classes frequently score less than 50 per cent utilization of available time. Better management would eliminate the waiting lines altogether, reduce the pupil interview to the minimum actually needed, and reduce the time lost in the interval between the pupil's call and the teacher's attention to his call to a negligible amount.

Assuming that all the suggestions here made are put into effective operation, there will still be individual pupils who have not learned to yield sustained attention. Many of these cases will yield if the teacher bears in mind the principle that he is teaching the group as a whole and not merely the pupils who are ready to attend. It is of course futile to call out to the inattentive, "I want your attention." Equally futile is it to indulge in some sarcastic remarks calculated to penalize the inattentive. The writer has himself many times practiced and seen others practice the following technique. After a few minutes of teaching, the inatten-

tive are noted. The teacher then talks directly to these people with the conscious purpose of drawing them within the attentive group. Within a brief time, he notes that the inattentive begin to be restless, glances turn tentatively in the direction of the teacher, and eventually one after another they settle into attentive attitudes. If now the teacher does not forget them, but persists several days, he will be pretty likely to cure all but a very few stubborn cases.

These last become regularly identified problem cases, subject to corrective measures, the basis of which is training in sustained application. The latter aspect of control technique is discussed in the next chapter.

CHAPTER IX

SUSTAINED APPLICATION

THE term "sustained application," within the meaning which we attach to it, applies only to volitional attention to a school task which does not initially carry its own motivation. The contrasting attention is that which is devoted to an activity which is in itself appealing, the reading of a stirring story for instance. The latter may be called *absorption*. In a sense, the fundamental problem of teaching is so to train the pupil, so arrange his studies and so apply an effective operative technique that he will eventually be able to become absorbed in any study which in itself is worth while.

Apparently, the power of effective sustained application is something which must be acquired. It does not come of itself as an element of the personal growth of the pupil. Hundreds of observations on individual pupils and university students, from the lower grades throughout the graduate school, exhibit little essential difference in capacity for sustained application—apart from training of one sort or another and apart from the intellectual interests which have been casually or systematically developed.

While we are concerned in this chapter only with that aspect of sustained application which is sometimes called concentration, that is, attention to a task during a class period, it must be remembered that there is another aspect, namely continuous application to a task over many days. Both aspects are important in the generalized conduct attitude (see chapter xx, page 419). An almost universal characteristic of children is their inability to persevere to the completion of an enterprise to which they have set themselves. Monkey-like, they are always embarking on new schemes which they never follow through. Natural enough in children, the trait is infantile in an adolescent or adult. There are

innumerable opportunities in the routine of the school, the long science-type assimilative period for instance, for experience in this form of sustained application which we call perseverance. Nevertheless, the essential learning product is not likely to emerge unless the ideal which the experience illustrates is made to register.

I

MEASURING AND RECORDING.—Study of sustained application and systematic use of the principle in teaching technique alike require a method of measuring and recording. We shall need, not only to measure application, but to record its character. For this purpose, the student, the supervisor, and the teacher will find the sustained application profile described below useful (see Fig. 2).¹

The column to the right of the heavy vertical line stands for application; that to the left for distraction. The spaces marked off by the horizontal lines are time intervals. The light horizontal lines mark off spaces of ten seconds each, and the heavy horizontal lines mark off minutes. The observation used in the illustration was made upon a girl in an VIII A class in a city school. The observation ran for twenty minutes, during which there were recorded four hundred and seventy seconds of application (of poor quality) and seven hundred and thirty seconds of distraction.

In making the record, the observer found a position from which he could clearly watch the pupil, even to the extent of being able to follow roughly the eye movements, and such that the pupil was not conscious of being watched. With timepiece in

¹ The forms for recording both group attention and sustained application can readily be devised by the practicing teacher himself. If it seems to be better to use ready-made forms, the latter can be obtained in quantity through the University of Chicago Bookstore. Three such forms have been printed as follows:

1. A form for recording group attention.
2. One for scaling sustained application.
3. A more extended sheet devised by C. R. Maddox for noting and profiling both group attention and sustained application in the group as a whole. The latter is particularly useful for diagnostic purposes. It requires more skill in the observer than the other forms.

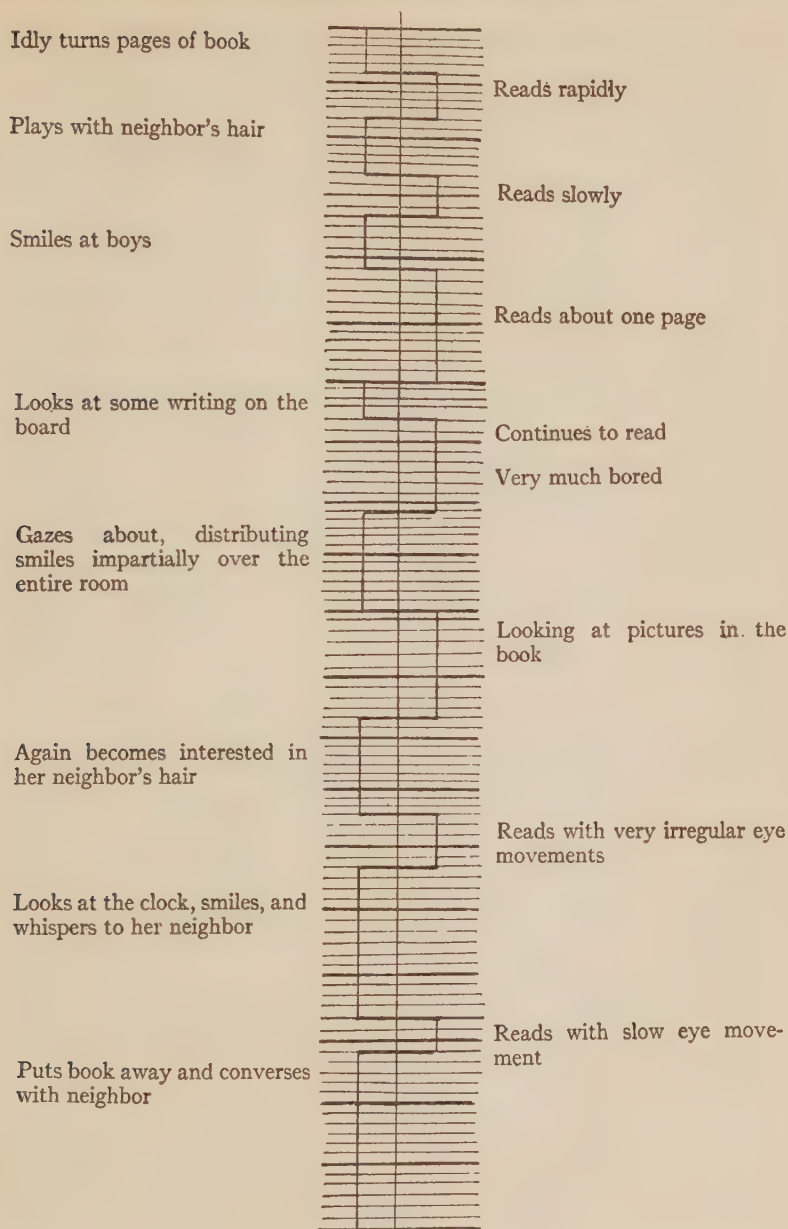


FIG. 2

hand and observation pad in a convenient position, he then noted the shifting of the phases and recorded the time elapsed for each to the nearest ten-second interval. He also noted, as well as he could, the behavior of the pupil during each phase. When the observation was complete, he made a neat profile with notes, for the pupil's case-history folder.

In discriminating between application and distraction, the general rules laid down in chapter viii apply, and they need not be repeated here. The reader is reminded, however, that the pupil must be unconscious of the observation. As soon as the latter becomes conscious, either spurious application will be set up or else he will become idly curious of the observer's intentions and in that way set up prolonged distraction. If the observer secures a profile during fifteen or twenty minutes and the pupil then becomes conscious of observation, the record may be brought to an end and the profile may be reserved for study as useful and significant. If the pupil early becomes aware that he is being profiled, the observation would best be deferred to a more convenient period.²

The profile taken is that of a placid, untrained pupil whose study habits are practically nil. She is probably a part-learner, of the get-by, lesson-learning type. The percentage of application is 39. The average span of application is sixty-seven seconds, with a range of 30-110. The pupil starts the period with a distraction interval, which is itself apt to be symptomatic of poor study habits. The recorded behavior during the application in-

² A word of warning is perhaps called for. A good many teachers, especially at high school and college levels, are so devoid of all scientific attitude toward teaching that they tend to exhibit defensive reactions in the presence of any supervisory observation whatever. Such teachers are likely to find all sorts of reasons which taken together are supposed to invalidate the measuring procedure. "That is the pupil's way; he is really attending to business." "The pupil fooled you all the time." In one case, a singularly irresponsible classroom demagogue actually coached his pupils beforehand what to do in order to deceive the observer. Such teachers need to be convinced beforehand, to be enlightened as to the purpose of the observation, and perhaps in some cases to be disciplined.

tervals is evidence that such application as there is has little or no value.

This profile is perfectly typical of the healthy, untrained early adolescent, possessed of the volitional powers and study habits of perhaps the nine-year-old child. She is probably susceptible to immediate steps in the direction of training in the manner suggested below. Different is the case of the pupil who exhibits a profile like that shown in Figure 3.

This is the typical "fidgety" pupil. Before beginning the training process, it is well to look into the physical background of a profile of this type. It may be that the seat is uncomfortable and perhaps irritating or that the light on the desk is bad, or that there is a continuous distracting noise of some sort going on. It is more likely to be true that the pupil is subject to some bodily irritation. It may be bad teeth, eye-strain, irritation of the genital or anal region; or more general disorder of the alimentary tract traceable to bad eating habits or improper food. Insufficient sleep may be responsible. In any case, before attempting to develop sustained application, this whole region of possibilities should be considered. The parent will perhaps need to be called in and either through the family physician or the school health department a thorough physical examination secured and remedial medical treatment arranged for if needed. Nevertheless, it should not be assumed off-hand that every such case necessarily calls for the intervention of the physician. Aware of the possible explanation, common-sense should guide the teacher.



6 minutes

FIG. 3

II

TRAINING.—Figure 4 shows the progress of a piece of systematic training, and to this constructive work we now turn. In

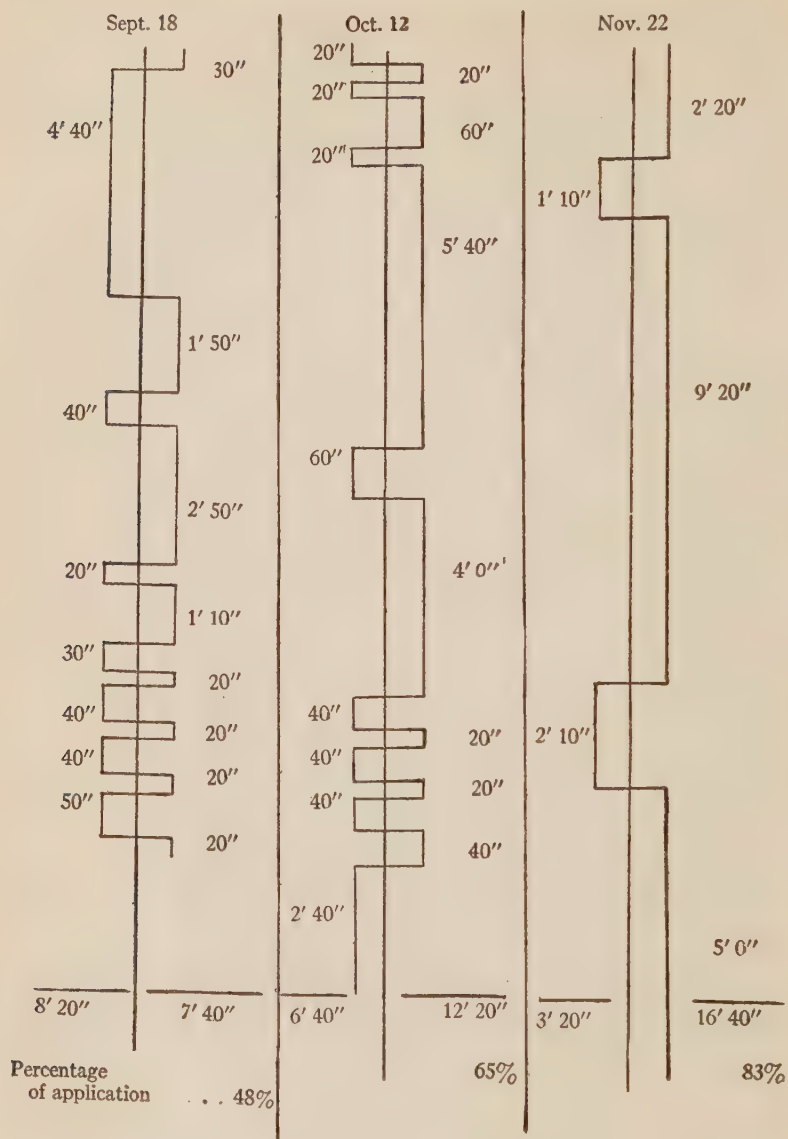


FIG. 4

the presence of such a problem, there are commonly to be found three different attitudes among teachers and these are perhaps worth noting, for they throw a great deal of light on the attitudes of different kinds of people to teaching in all its aspects.

The first of these teachers encounters the boy profiled in Figure 4 early in the school year. He notes the pupil's lack of a trained volitional capacity in his study and renders the fatalistic verdict, "George cannot concentrate." That is the end of it. His great-grandfather would probably have explained the situation more fully by asserting that "the boy is clearly not one of the elect." He was predestined from the foundation of the world not to be able "to concentrate." Our modern friend would say that he has clearly inherited "lack of concentration" and that it is fortunate that we have discovered the fact so early as September in the seventh grade, for we shall now advise him not to continue in school but to seek some vocation in which concentration is not necessary.

The second teacher, who has the reputation of being a strong disciplinarian, says that what George needs is "to be made to concentrate," and he forthwith descends on the boy in such fashion that the latter becomes most skilful in setting up spurious sustained application, that is, he "looks at his book." There is no denying that a pupil under this process sometimes encounters material in the book which sets up a sustained motivation and thereby profits. He is a great deal more likely to become an accomplished time-server and to build up a complete anti-learning attitude.

The third teacher communes thus with himself: "This human organism, George, is doubtless like the rest of his kind, exceedingly adaptable. We must find some way to convince him that he does not stick to business in his study and further that such is obviously the probable foundation of the poor work he is doing. He does not seem to have any particular pride in poor work as such nor does he appear to derive satisfaction from it." And so

the process of setting up a real volitional learning product is begun.

Now if we could be made to see ourselves as others see us, we should probably lay aside all but our most cherished follies. Being reprobated for them, however, makes little impression upon us other than to lead us to avoid exhibiting the said follies in the presence of the person whom they seem to irritate. It is of little consequence to inform George that he does not concentrate; he does not know what is meant. Bidding him "to study" does no good. Studying is something he has yet to learn. On the other hand, if the teacher, unobserved, makes a picture of the boy at work for, let us say, fifteen minutes, and then privately exhibits to him his likeness with a clear explanation showing why this sort of thing is intimately related to his difficulties with his school work, something may come of it.

In the case which we present something like that was done on September 18.³ Little more was said beyond the statement that he, George, could improve himself and that some day the teacher would make another picture and see what happened. The pupil at once became motivated, that is, he saw a meaning in the teacher's communications. The profile of October 12 shows notable improvement. It can be seen that for the first two minutes or more the boy has a struggle with himself. He has, however, transferred his long phases from the distraction side to the application side. He can "keep going" for nearly ten minutes with only one resting-point, and the latter is not a period of restlessness. He has improved his gross application from 48 to 65 per cent, but there is still room for improvement. The profile for November 22 is nearly normal for the kind of work he is doing. He starts in application, shows no restless periods, and ends in application. His rest intervals are still too long, but he is doing

³ The pupil in this case was a retardate in the rapid-promotion group of the Ben Blewett Junior High School, St. Louis. The case is reported by Miss Dena Lange. The boy's name is of course fictitious. Poor concentration was only one of the boy's troubles.

well enough for the present. If he is profiled occasionally, he will eventually show an absorption profile, i.e., a profile like that of November 22 but with the rest periods reduced to mere momentary distractions. His gross percentage is now 83 over a period of twenty minutes, but the character of the profile is more significant than the percentage of application.

Before setting out on the program of training thus described, the skilful teacher will canvass the situation, and remove possible external stimuli of distraction. We have already seen what this means in the case of the pronouncedly restless and fidgety pupil. George at the outset has some appearance of this characteristic, but we note that he can sit placidly in distraction for nearly five minutes, and there is therefore some reason for thinking that his bodily condition is not predominantly responsible for his restlessness. But there are many distracting influences at work in the school which are not related to the bodily organism. George very probably has a neighbor, the presence of whom constitutes a mutual distracting influence between the two. After exhibiting the first profile, we may suggest to the two neighbors that they will be helped if for the present they occupy other seats. We may suggest to the girl, Blanche, whom we may have occasion to study, that it would be wise for her to leave her vanity box in the girls' dressing-room or still better to forego those charms to the endurance of which the vanity box seems to be essential. Mary may be told that the temperature of the room seems hardly to justify the protection of her new fur coat. Nevertheless, such matters should come to the pupil not as commands but only as suggestions. We are building up a learning product, and the test of such is always voluntary behavior. It may be that the neighbors will continue to sit together and that Mary will continue to cherish her new garment and still resist distraction. If such is the case, the learning is distinctly better than otherwise. Ability to resist distraction is better than skill in removing temptation, albeit the latter is doubtless more economical.

III

RELATION TO RATE OF LEARNING.—Thus far we have emphasized the relation of sustained application to the merit of the pupil's school work, or better to the facility and the completeness with which he learns. The reader must not be misled by such emphasis. Other things being equal, the pupil's power of sustained application will bear a very direct relation to the learning which he does, but other things are not always equal. This pupil may have a very respectable degree and quality of sustained application and still his learning may be difficult and slow. He may present an inadequate apperceptive mass, that is, he may have fatal gaps in his experiential and learning background. The teacher's presentations may be defective. Another pupil may be a bad reader. There may be any one of a host of inhibitions. Hence, a pupil who has poor sustained application may not be able to correct his inadequate learning by improving his application; additional correctives may be needed. But, poor sustained application is incompatible with efficient learning. The pupil who learns in spite of it would learn more, learn better, and learn more rapidly if his application were corrected. If we find a non-learner with poor sustained application, our first step in the corrective or remedial process is to develop this essential power. In order to make concrete the significance of improving application as the foundation of improving study capacity and the learning which goes with it, the following case study is presented in brief. The study was made in the winter of 1924 in the University High School by Miss Catherine Morgan, a student of the author.

The subjects are two girls, whom we will call A and B, enrolled in an eighth-grade elementary science class. The pupils had entered the school in October, 1923. Their previous school history in brief had been eight years in the public schools. The study and experimental teaching began January 22, 1924, and ended March 11. The I.Q.'s were 115 and 109, respectively. At the beginning of the study, in point of time required for mastery,

A was one of the slowest pupils in the class and B somewhat below the median.

Seven profiles were first made, in order to secure the characteristics of each girl. The pupils were then shown the profiles by the teacher and the process of training was carried on in the manner which we have already described. Profiles were then made on February 6, 7, 15, 19, 26, 27, 29, and March 11.

Figure 5 shows the profiles at the beginning of observation. These are, on the whole, poorer than others in the first series of

TABLE IV

	JAN. 22-23		FEB. 7		MARCH 11	
	A	B	A	B	A	B
Percentage of application.....	67	84	95	89	91	87
Number of distractions.....	13	10	5	12	5	8
Mean span of application.....	61	101	190	79	218	130
Range in span of application.....	10-250	20-410	70-420	20-160	80-390	20-345

seven, but they represent typically the two girls at what may be called their "untrained level." Figure 6 exhibits the profiles on the second day after conference; and Figure 7, the profiles at the end of the period of observation. Inspection of the series will reveal the improvement both in quantity and quality of application. If the whole series of profiles were exhibited, it would be seen that there were fluctuations from day to day, but that, on the whole, the trend was upward. The improvement is shown more exactly in Table IV.

Pupil A shows a distinct and sustained improvement in both quality and quantity of application. She increases her percentage of application markedly and decreases the number of her distractions. She improves her mean span of application and her shorter periods of application. In other words, she studies more and studies more steadily. Her chief remaining opportunities for improvement are: (1) to decrease the number of distractions, for

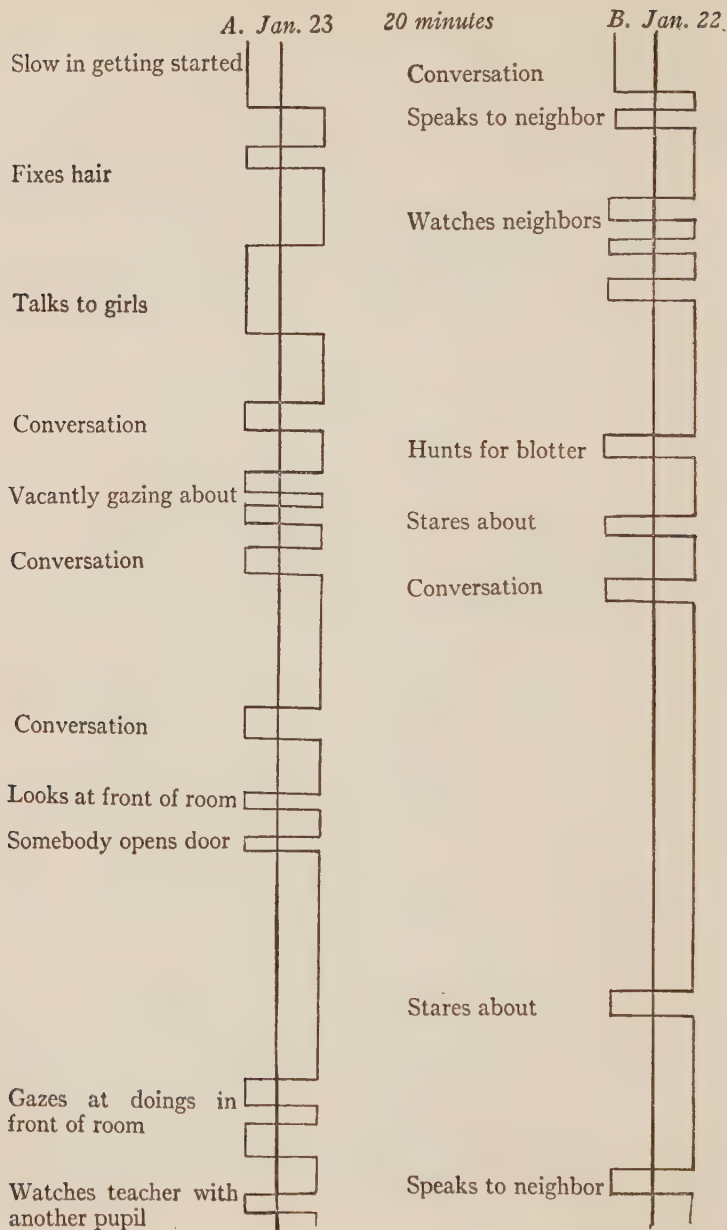


FIG. 5

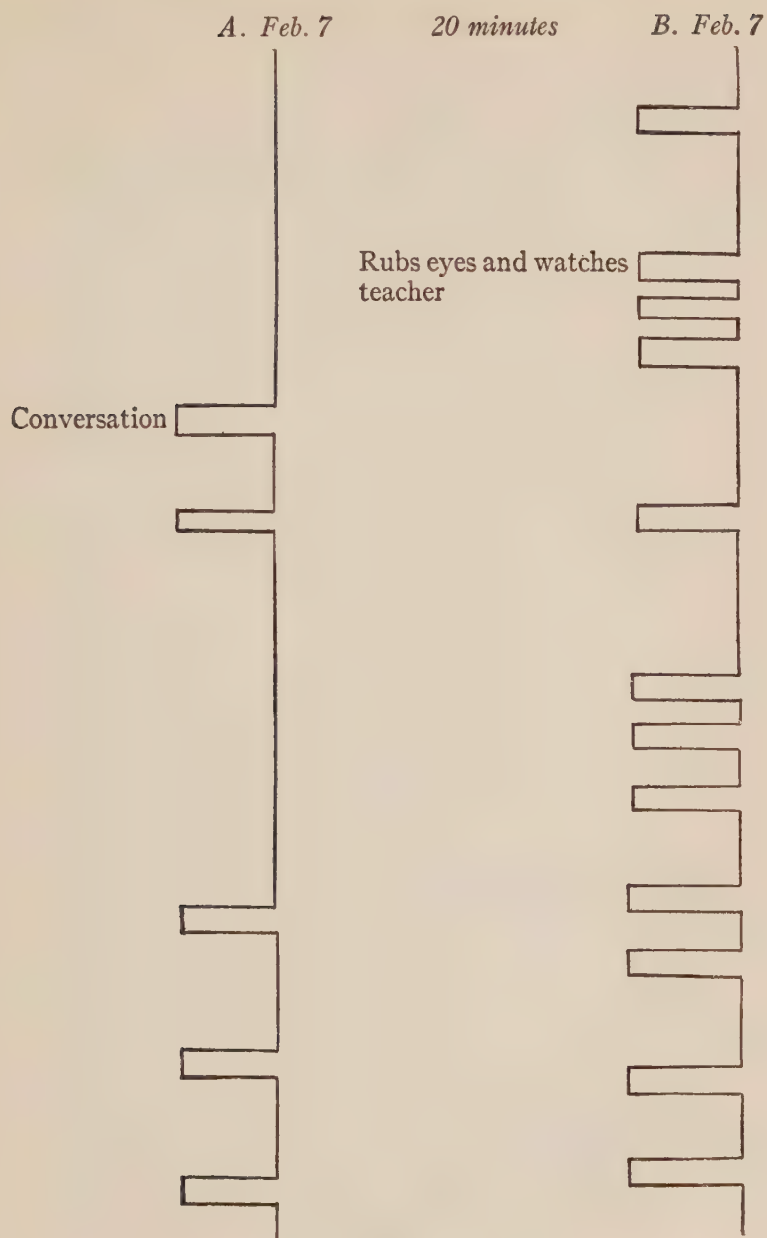


Fig. 6

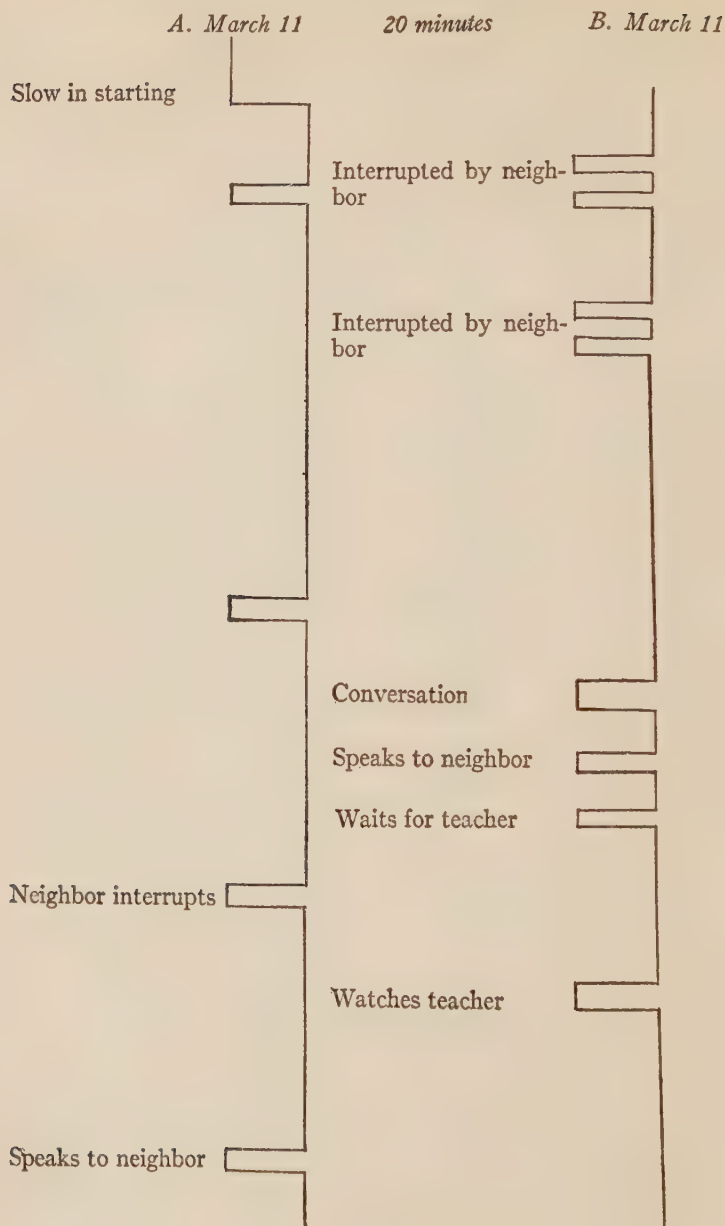


FIG. 7

she still allows herself to be interrupted at the rate of fifteen times in every hour; (2) to increase her shorter periods of application.

Pupil B improves somewhat, but not much, in both quantity and quality. Reference to the behavior record of March 11 shows her outstanding faults: she is still too much interested in her neighbors, and she is inclined to depend somewhat on the teacher. By concentrating on these points, the teacher can eventually train her to full volitional absorption.

TABLE V

	PUPIL A		PUPIL B	
	May 15	May 16	May 15	May 16
Percentage of application.....	89	95	96	97
Number of distractions.....	7	3	3	1
Mean span of application.....	156	407	411	970
Range in span of application.....	10-620	30-1,210	80-1,060	270-1,300

Neither girl exhibits the dawdling profile of the pupil pictured in Figure 2.

Observations were made on these two pupils by a regular teacher two months after Miss Morgan's last observation. The new observations covered fifty minutes instead of twenty minutes, and the test conditions were therefore more exacting. Tabulation of results is presented in Table V.

The numbers of distractions in the May profiles are reduced to the number per twenty minutes, in order to make them comparable with the numbers shown by the January, February, and March profiles. Otherwise the figures for May are on a basis of fifty minutes.

During the period which elapsed between March 11 and May 15, no training whatever was given. The sustained application shown by the profiles was purely that which had been established earlier. The distinctly better record made on May 16 may very probably have been due to the fact that the pupils discovered that they were under observation once more and spurred. Never-

theless, if we compare the records of May 15 with those of March 11 and then with those of January 22-23, there can be little doubt that we have here a true learning product—a volitional adaptation.

It will be recalled that at the beginning of the period of training, A was one of the slowest pupils in the class. As a matter of fact, she was consistently one of the slowest three. At the end of the period, there were only three pupils who learned more rapidly. At the beginning, B was somewhat below the middle of the class; at the end, she was somewhat better for she was among the eleven of a class of twenty-four who learned most rapidly. More than that, the class group had been drawn somewhat more closely together by simply training one of the slowest pupils out of her bad habits of work, thus effecting not only substantial progress in the education of an individual but likewise an economy in the group teaching of a class. To the extent of improvement in one laggard, mastery for the group became more possible, the need of sectioning the group was decreased, and better progress for the group as a whole became possible.

A represents a simple case of corrective teaching. She is not handicapped by gaps in her intellectual background, by physical inhibitions, by low mentality, nor by any other of a multitude of possible obstacles to learning. All that was needed was to correct her scatter-brain ways. B presents a slightly different condition for she was weak in arithmetic. Nevertheless, with a small improvement in her sustained application, she rises into the half of the class which works more rapidly and, as a matter of fact, at acceptable speed.

It is far from true that training always turns out this way. Sometimes we find a pupil who is a definite remedial case in the whole volitional field—usually a spoiled child. Other and additional measures are then required. Again a pupil is found who, in spite of poor sustained application, does creditable work. Usually the indication is that he has not enough to do and should either be transferred to a faster section or interested in a volun-

tary project. The crux of good teaching is not to accept the profile as it stands but rather to interpret it in terms of the pupil profiled.

CLASS TEACHING.—Should all pupils be subjected to the same individual training? In theory, yes; in practice, it need not be necessary. In the first place, a considerable number train themselves. Further, the teacher can usually train the group in the same manner in which A has been trained. Suppose, for instance, after securing the profile of A for January 23, the teacher had placed the profile on the board, without naming the pupil, and had talked to the class as a whole much as she talked to A. With many of the pupils in a class containing many A's, the improvement would have been as marked as in her case. The problem with every class, from the grade level at which pupils begin to study, onward, is to bring every pupil up to the level of the absorption profile, not only because that is a fundamental step in the pupil's education and in developing his ability to study, but also because it necessarily brings about economy in the process of group instruction. In practice, the teacher can survey his class and determine by inspection the pupils who need no specific training and likewise those who are in this respect problem cases. The latter being identified, corrective training is carried on in the manner which we have described.

IN REMEDIAL CASE WORK.—A record of sustained application is one of the first steps in the investigation of a remedial case assigned for special treatment. In a large percentage of such cases, poor application is associated with, if not originally responsible for, the maladjustment which eventually requires remedial treatment. This is particularly true when the maladjustment is purely experiential in character, that is, where there are gaps or half-learning in the educational history. There is little likelihood of lasting adjustment unless this fundamental defect is corrected as well as the other defects which are the immediate occasion of trouble.

PART III
OPERATIVE TECHNIQUE

CHAPTER X

INTRODUCTION TO OPERATIVE TECHNIQUE

BY "operative technique" we mean that phase of the teaching process in which the units of learning are developed in the class and in the individuals thereof. It includes presentations of one sort or another, the supervision of study, the testing of the pupils for the adaptations which the learning units contemplate, identification of pupil problems, and corrective teaching. Why distinguish different phases of the teaching process, such as control technique and operative technique?

If we should lead ourselves thereby into the habit of looking upon the two phases as essentially disparate and successive, the effect would indeed be unfortunate. Good control technique is the foundation of good operative technique, but poor operative technique may make good control difficult or impossible. For instance, daily lesson-hearing is a poor form of operative technique, and sustained attention is exceedingly difficult under that procedure. On the other hand, devotees of that view of interest which makes of it little more than educational pleasure-seeking frequently adopt an operative technique which buries the fundamental volitional adaptations implied by sustained attention and sustained application under a mass of pupil self-indulgence. Their operative technique is often brilliant and showy, but essentially non-educative. And so the two phases of teaching are closely interrelated as is indeed administrative technique, to be discussed later, with both. Nevertheless, it is useful to distinguish the several aspects of teaching for a variety of reasons, among which may be mentioned the following.

In the first place, to do so enables us to think more clearly and more precisely about the process of teaching itself. It is a great help, in orderly and clear thinking about matters which are at

best complicated, to be able to analyze the subject of our thought in significant ways, to deal with each part by itself, and then to see the interrelationships of the several parts.

In a practical sense, it is useful because it makes it easier to locate and correct teaching troubles. We have seen that the first step in dealing with a problem case, or indeed with a poor class, is to investigate the control technique. We can often correct trouble at that point. If we find the control technique good, we can eliminate that whole region, and proceed successively to the fields of operative and administrative technique, each of which we shall find to be capable of analysis.

The five types of teaching which we have enumerated in chapter vi are the subject matter of Part III. The differences in operative technique from type to type are a great deal more important than the features common to all types, but we must note certain underlying general principles which are frequently violated, with results fatal to that attainment of the learning units which we have called "mastery."

I

THE LEARNING CYCLE.—The first of these principles we shall designate as the *learning cycle* of stimulus, assimilation, and reaction. The cycle is apparently the process through which all adjustments to environment at the level of human consciousness are made. In order to make our meaning concrete, we may perhaps use that never failing source of illustration, the care of an automobile.

After purchasing the first car, most of us go through rather a futile period of lesson-learning with the book of instructions. After a time, as we drive over the country roads, we become irritated by the unsatisfactory behavior of the machine. It skips, balks, and refuses to climb hills as it should. The stimulus culminates, and we resolve to find out what is the matter. Now follows a period of experience-getting or assimilation. We examine the engine, read the book of instructions, discuss our troubles

with our friends, vaguely experiment with this feature and that, reflecting at every step. Finally, the explanation dawns upon us, and assimilation culminates. We now react to our theory, make the appropriate adjustment in the mechanism, and peace once more enters the soul. We have acquired a new intellectual attitude to that general region of automobile mechanics from which the stimulus came. When the same symptoms recur later, we proceed directly and *intelligently* to remedy the trouble.

Now, we might have balked the learning process at either of two points. After experiencing the stimulus, we might have driven the car into a garage and paid for having it adjusted. We should have restored our mental equilibrium, so far as that particular experience was concerned, but we should have learned nothing. Quite likely we should have acquired a stimulus in the field of economics. Again, after having become satisfied with our explanation, we might have employed a mechanic to correct the trouble. Our learning would have remained a vague memory of an experience. When we have located trouble, accounted for it, and eliminated it ourselves, the whole emotional coloring is quite different from that which is experienced when we have stopped with our assimilative hypothesis. We experience a sense of reality and assurance.

The vital importance of the reaction member of the cycle as a part of the learning process can be realized by most teachers, if they will recall their intellectual grasp of what they have taught as compared with their hold upon what they have covered in school or college but never taught. We often make a subject our own for the first time when we teach it. The explanation is found in the principle that then for the first time we pass through the reaction member of the learning cycle.

Schoolroom procedure frequently omits the stimulus member. The pupil is brought into the presence of the new learning in a purely passive state, without curiosity, desire, constraint or any other immediate incentive. He delves into the experience which is assumed to be appropriate without mental focalization upon

the learning unit intended by the teacher. He may encounter a stimulus in the study period which will start a learning cycle, but whether or not the learning process thus started will lead to the learning intended is largely a matter of chance.

Experience which might be assimilation under systematic teaching is seldom omitted, but, under the textbook, daily-lesson practice, such experience is seldom focused upon the unit of learning intended. Performance at the daily task is mistaken for study. Again, if any learning results, it is casual rather than systematic, and as such directed to a definite learning objective. It may well be that we have here the fundamental explanation of the pedagogical phenomena noted in chapter iv in our discussion of lesson-learning, and perhaps the explanation of the chance distribution of pupil attainments so often encountered in the schools and thought by some to be the inevitable characteristic of group learning.

The reaction member is commonly omitted altogether, until some chance experience in life calls for the re-assimilation of the material studied in school and the establishment of the adaptation in a real reaction. Such is apparently the case when we come to teach half-learned principles or processes, already used in illustration.

We can scarcely hope to establish the learning cycle, in the more or less artificial conditions of the schoolroom, in the vigor which characterizes it when it occurs under natural conditions. Nevertheless we can do much. After all, learning under the hit-or-miss conditions of nature is a wasteful affair, and the individual is perhaps only slightly more likely to learn the truth than to learn falsehood. On the other hand, the learning of the school can be made systematic, the needed objectives can be consciously and definitely selected, and what the learning of the school loses in point of vigor can be much more than made up in the systematic methods which the school is able to employ. In the operative technique with which we shall deal, an effort is made to give due heed to the requirements of the learning cycle. The cycle is much more

obvious in the science type, in which indeed it is perhaps most imperative. It is only less obvious in the appreciation and practical-arts types. In language arts and pure practice, the three members of the cycle tend to coalesce, but they are none the less present and their importance cannot safely be ignored. For example, in the learning of a foreign language, free reading of books as distinguished from scrappy exercises constitutes the reaction member.

II

INITIAL DIFFUSE MOVEMENTS.—The second of the important general principles upon which operative technique in all the types of teaching is based is the principle of *initial diffuse movements*.

The operation of the principle can perhaps be most clearly pictured by an illustration from the pure-practice type, learning to skate let us say. In the learner's early attempts, his whole body passes through a series of violent contortions. Not only do his legs perform random movements unrelated to the ultimate needs of the art, but his arms swing wildly, his body jerks backward and forward in futile attempts to maintain equilibrium, his face quite likely is contorted in grimaces, he repeatedly loses balance and falls. The expert bystander gives him specific instructions which are not only useless but irritating. He perseveres, however, and soon his movements begin to co-ordinate, the useless are eliminated, and eventually he can skate. He has reached what we may call the "skating adaptation." If now he wishes to become expert, he must begin to acquire skill at the level of his adaptation through conscious refinements and practice.

The working of the principle is perhaps best seen in the learning of ordinary neuro-muscular adjustments, but it applies equally to learning in all types. The infant in learning to talk gives us a particularly good illustration. For a time he apparently tries to talk with his whole body. When he later acquires a foreign tongue, though his unregulated movements may be less diffuse, he learns, if he learns at all, in much the same blundering fashion. The pupil who grows into an appreciation of a superior quality of

reading material does so through experimentation with relatively inferior, or at least immature, material which for a long time meets his fancy. The student who grapples with a law of physics, or a movement in history, or a principle in teaching, makes it his own only after much vague experience-getting, catching a meaning here, failing to get one there, reflecting, and finally catching the vision from which all non-essentials have been eliminated.

Apparently one of the important principles which govern the scope and organization of assimilative material or experience is the room required by the random movements of the learning process. Thus, in the assimilative material upon which unit learnings in arithmetic were based, we found by experimentation that whereas thirty or forty exercises were formerly thought to be sufficient, several hundred were in fact needed. It did not follow, however, that all pupils needed to work through all the exercises, for in some the period of initial diffuse movements was long and in others it was short. Similarly, in written expression, the period of diffuse movements is likely to be as long as the process of general education itself. Hence an immense amount of assimilative practice is required.

Conversely, fundamental economy in the teaching process consists in reducing the number of needless random movements. Effective control technique is the most important of the procedures which are calculated to achieve this result. Effective focusing of assimilative material or practice upon the learning objectives is another.

The principle is frequently violated in teaching because of the teacher's obsession for having everything right the first time. The teacher of handwriting in the early grades who identifies the elements of successful penmanship and builds up a series of artificial skills out of these simply produces a lesson-learner whose handwriting usually goes to pieces in high school, as nature reasserts her demand that the pupil shall build his adaptation on his inherited complex of neuro-muscular tendencies, in much the way in which he has built his characteristic walking gait. The

teacher of English composition who conceives it to be her mission to train pupils in correct usage apart from an abundant volume of free writing, all of it designed to express meaning and most of it inexpressibly crude for a long time, usually fails to secure either correct or incorrect expression. Far better that the pupil should say "ain't" than that he should say nothing at all. The teacher of mathematics who inculcates a principle, hears his class recite, grades their responses, and passes on to another principle, without giving ample opportunity for experimentation with the application of the principle, commonly succeeds in producing pupils whose mathematics is good until examination day but not beyond. The law of initial diffuse movements spells patience, abundant assimilative practice or experience for the pupil, and a realization that early blunders are signs of learning health rather than evidences of failure.

III

IDENTIFICATION OF THE TEACHING OBJECTIVES.—The third of our cardinal principles is *identification of the objectives of teaching*. The principle seems so obvious as hardly to be worth noting. Nevertheless, it is so commonly ignored or misconceived in practice that we have felt justified in devoting a considerable part of this volume to emphasis upon its importance and to tracing the nature of the various kinds of objectives.

While there is apparently marked progress in the critical study and evaluation of the objectives of the curriculum, there is little evident progress in determining the teaching objectives implied by those of the curriculum. It is one thing, for instance, to decide whether or not the use of the French language is a desirable curriculum objective; it is quite another to fix in our minds the specific learning and teaching objectives which the use of the language implies, if we teach it at all. Again, it is one thing to conclude that intelligence concerning the organization of society is a desirable piece of curriculum content; it is quite another to set up a series of teaching objectives through which the desired intelligence can definitely be secured in the individual.

In the great majority of classrooms which one visits and in the great majority of programs of study which one reads, there are, strictly speaking, no teaching objectives set up. We are likely to find instead a list of things to be done, or a syllabus of ground to be covered, evidently in the hope that the pupil will learn something as he passes through the routine. "We have fractions in Grade V" or "College English in Grade XII" is about as near as such schools approach the identification of their teaching objectives.

Now, if we look upon all learning, and indeed education itself, as a series of adaptations to be made in the learner, we must evidently have definite and comprehensible objectives to be mastered. We cannot apply our formula, "Teach, test, and reteach," unless we can have a definite unit of learning to which it can be applied. In whatever type we are teaching, the critical question always is, What new attitude or ability am I trying to bring about in these pupils? and not, What is the textbook content to be covered this term? The objectives of teaching change from type to type as the nature of the adaptations desired changes, but always and everywhere the starting-point of operative technique is the determination of the teaching objectives. Nor is it an easy matter. Most of them can be found only after thorough study of both the academic material to be used and of the pedagogical principles to be applied, the application of all the insight of which the teacher is possessed, and then experimental teaching.

Since the first edition was published, the author has been in receipt of a great deal of correspondence touching the principles therein set forth. One of the commonest requests has been, "Please send me the units for ———." No more fundamental misconception of the nature of teaching itself could be disclosed. No doubt working lists of units or teaching objectives are being formed and published, and that is a great help. Nevertheless, no such list achieves its essential purpose unless the teacher using it is a student of the history, science, literature, or what not, which is utilized; nor unless the teacher sees every teaching situation

as a problem to be solved and is equipped to think it out. The right attitude is exhibited in the following incident.

A certain young woman, a fourth-grade teacher, had become well equipped with the fundamental pedagogical principles involved. She was confronted with the task of inaugurating a course in history, and found, despite her high-school and college courses in history, that she knew little history. Accordingly, she devoted her whole summer vacation to saturating herself with the history she would have to utilize in teaching. She did not "take a course," nor secure "three credits in history." She read history. She did not become a professional historian, but she did admirably qualify herself to guide and teach this course. The units which had been worked out for her came to have definite and vital meaning. In case of need, she would have been able not only to revise that list but to work out a new list.

IV

DIRECT TEACHING.—The fourth of the general principles which are applicable in all types of operative technique is that of *direct teaching*. This term has found its place in our pedagogical terminology in its application to a method in foreign-language teaching. There it signifies the development of the power to use the language as a form of discourse by practice in such use rather than an approach through the study of language structure. The appropriateness of the term "direct method" lies in the principle that the method proposes to attack the adaptation desired, in this case a reading or speaking or writing ability, directly, instead of through an intermediate form of learning, in this case language structure or grammar. The latter is in effect one form of lesson-learning and attainment of the adaptation in that way is, as we have seen, a matter of chance.

Direct teaching is not, however, confined to language learning. It applies equally well to all learning. In the practical arts it has been very largely the theory of teaching used from the beginning. In the shop or the dressmaking-room, pupils do not read or listen

to lectures about the processes which they are desired to learn and pass examinations on what they can remember. They learn "by doing," which is another expression which has crept into the language of teaching and which implies the same pedagogical principle which we find elsewhere signified by the term "direct method." The principle is precisely as applicable to the teaching of science or mathematics or history as to the teaching of French or auto-mechanics. In the first three subjects just mentioned, the contrast is between centering all teaching and study directly upon a major unit of understanding, such, for instance, as "Infection," or "The Westward Movement," and assigning indefinite reading material and exercises from a text book in the hope that the pupils will eventually know their history or their biology.

Teaching which aims at the objective directly, records pupil performance, and then passes on is however only half direct teaching. The more essential half is found in the principle of corrective teaching, or the application of the testing and reteaching members of the mastery formula. Apart from corrective instruction, there is fundamentally no systematic teaching at all but only the administration of one form of intelligence test.

V

STUDY.—The fifth of our fundamental principles is that of *study*. The dictionary definition of study is substantially "learning by one's own efforts." In our school use of the term, it means learning through the use of books or other appliances which give access to enlightenment or to an art. In a recent report, President Lowell makes the following statement: "Anyone who has taught Freshmen is aware that they cannot read books. They can read passages, and understand the meaning of particular things when pointed out to them; but they have not the habit of sustained mental self-direction that will enable them to follow the thread of an author's thought for a considerable time." In other words, they have been brought up to be textbook lesson-learners.

We have stated and often reiterated the principle that in so far as the secondary school fails to train pupils how to study, develops in them the inclination to attack their world through study, and finally makes them capable of formulating their own problems and studying at the level of self-dependence, it fails altogether. Apart from this contribution, it might as well leave them with the primary adaptations and trust them to secure adjustment to their world through the aid of the newspaper, the periodical, and such books as they can find.

Now, a large part of the contact which the pupil makes with the present-day school is not study at all, but what we may perhaps call "education by propaganda." The school-health program is a good illustration. Here we have all sorts of talks by teachers, posters, lithographs, even vaudeville performances, in the interest of good health. In so far as the objective is to induce pupils to take better care of their health, the objective in itself is worthy and the technique is certainly effective. Other forms of this sort of thing are thrift campaigns, good-English weeks, selling Latin to the pupils, patriotism, cleanup-and-paint weeks, the city beautiful, and so on in an endless series. Far be it from me to decry either the worthiness of most of these purposes or the technique used in securing them. In many instances, that is the most economical way in which an immediately desired objective can be realized. Only, it is not training pupils to study and not leading them into the inclination and the ability to attack their world through study. It could be used as effectively out of school as in school. In so far as the school conceives such devices to be the essence of teaching, it will fail in its supreme task of generating citizens who are capable of independent thinking. The psychology employed is that of the advertiser, and it is a sorry society which is borne along at the beck of a multitude of special and often selfish interests each seeking its own ends through the use of advertisements and other forms of propaganda. One need not go far in the streets of a great city or in his reading of current magazines and newspapers to see what a few years of propa-

gandist schooling, as a substitute for studying, has done to us as a people. The rising generation has in large measure learned not to create but to advertise; not to be persons but to copy the pattern administered to the mob.

Each of the five types of teaching discussed in the chapters which follow has its own method of study, ranging in importance from that of the science type, in which learning is very largely a matter of study, to pure practice, in which study is at its simplest and minimum. In each of the five types, the mission of the teacher is in the end to put the pupil in effective control of the learning methods peculiar to the type. At the level of educational self-dependence, the student can use the method of study which is appropriate to his problem, and he has the resolution needed to launch him in new learning. If he needs a new process in mathematics, he knows how to secure command thereof. If he needs the use of a new language, he knows how to acquire it in the most expeditious and economical fashion.

VI

APPERCEPTIVE MASS.—A sixth principle fundamental to all operative technique, indeed an inescapable condition of all effective teaching, is the establishment of adequate *apperceptive mass*. The technical term thus used, as well as *apperception* of which it is a cognate, is somewhat in disrepute, but wrongly so. It is entirely true that English and American psychologists have tended to use the term in a sense quite different from that in which German psychologists, notably Wundt, have used the corresponding German word, if indeed there is any corresponding word. But we are studying pedagogy and not psychology. All learning is clearly the piecing of new learning to the old. The term used in pedagogy to designate this process is *apperception*. The word has the precise etymological derivation which we need in a technical term. Some of the psychologists, James for instance, have thought that no such term is needed, apperception and assimilation being synonymous. Not so. Apperception is assimilation,

but not all assimilation is apperception. Apperception refers to content; assimilation to growth. The former is pedagogical in connotation; the latter, educational, or indeed developmental in the broadest sense. If the reader is reluctant to use precise terminology, then "ideational background" or "experiential background" or "cultural foundation" will do nearly as well. Of course it is usually silly to use purely professional terms in talking to pupils or laymen who are naturally not interested.

We learn the new in terms of the old. It is probably impossible to acquire either new ideas or new abilities absolutely *de novo*. The new must have a point of connection in the existing experience of the learner. It follows that, other things equal, the pupil will learn most readily and most effectively whose background of early experience is most nearly a complete horizon, such that any line of needed adjustment will always find its appropriate starting point somewhere in the pupil's apperceptive mass of organized or unorganized intellectual content, information, tastes, and acquired abilities.

It is altogether probable that individual differences in learning capacity, which are so noticeable among the pupils of any class, are traceable to differences in apperceptive mass as much as to any one cause. Some children come from homes in which there is an abundance of reading material and a tradition of discussing books and current events in the family circle. Others have scarcely encountered the printed page outside of school. Some have had the varied experiences of village and small-city life. The experience of others is of the narrow sort peculiar to the city streets or to the meager environment of an isolated farm. Others still, quite likely some of those who have enjoyed the good fortune of homes of abundant reading, have had only the restricted experience of the large-city apartment house and yard, with an occasional trip to a city park. The experiential horizon of some is a complete circle. They have enjoyed wholesome, healthy lives in a normal environment of child society and contact with nature. In the cases of others the horizon is simply a more or less restricted seg-

ment of the circle. Unless the deficiency is made good, they can at the best be only specialists from the beginning. Outside their segment they are too ignorant to learn.

PERVERTED APPERCEPTIVE MASS.—Some children bring to school not only restricted or segmented experiential backgrounds but apperceptive masses which are perverted as well.

Through overmuch travel and hotel life or a surfeit of moving pictures, some have had such an excess of experience that definite problems in the learning process are created. In the laboratory an occasional reading problem in the primary school is traced to such an excess of artificial experience that any possible learning to read is inhibited by the child's blasé lack of curiosity about what he reads. In content, his experience requires the reading material which is suited, perhaps, to the junior high school. In reading ability, he is at the same stage as his contemporaries in the kindergarten or first grade, that is, he cannot read at all.

The child of the slum, or of the vicious home and neighborhood outside the slum, is apt to bring to school such a stock of perverted ideas and values that much of his later learning, instead of producing the adjustments intended, produces instead curiously perverted adjustments. Nor are learning perversions confined to the classes just named. Especially in the adolescent period, careless and thoughtless and immature teachers or parents sometimes allow children to come in contact with vicious literature or with revelations, more or less scientific in character, which the children are not yet sufficiently mature to assimilate and justly evaluate, with the result that the young people come to build up twisted apperceptive masses which are purely pathological in character.

Just at present, this is notably a characteristic of much college teaching, and indeed of that whole mass of pretentious and half-digested science, negroid culture, and Levantine civilization which is glibly called modernism. To such pupils even murder may look reasonable and proper.

A very fundamental condition of effective operative technique

is then the establishment in all pupils of apperceptive masses which are normal and so well rounded that the pupil will not encounter learning to which he is an entire stranger. The child experience must further be brought into what may perhaps be called "literate form." In the case of children of the city streets, especially, experience has been acquired and is expressed in the form of a *patois*. The child has a *patois* personality, so far as content is concerned, and the books which he begins to encounter in school belong to another world. For example, an obstinate problem case in reading is puzzled by the word "jewelry." The meaning having been made clear, he exclaims, "Oh, jack!"

The capacity of the school to fill up the rich and wholesome round of child experience which is outside of books is of course limited. Children who grow up in villages, or thickly settled rural districts, and in small cities are, other things being equal, the fortunate ones of their kind. The great city and the isolated farm alike will probably never be able to give a satisfactory substitute, although the modern city with its playgrounds and parks does the best it can.

A PROBLEM IN THE ORGANIZATION OF THE SCHOOL SYSTEM AS A WHOLE.—We shall perhaps be justified in using some space to point out ways in which the school life as a whole can be organized to meet this very fundamental need.

THE KINDERGARTEN.—In the first place, either an effective kindergarten system or a satisfactory substitute is essential, and so far as the present author knows, no satisfactory substitute has been developed. The modern kindergarten, divested of the earlier mysticism, provides in substance what the best of homes should provide and ordinarily cannot. In its motor activities, it supplies a kind of experience which many city children entirely lack and to which most are strangers in greater or less degree. In its stories, excursions, and other similar activities, it supplies an informational background which the cultivated home of leisure could doubtless supply but which it seldom does supply. In its controlled group life it furnishes a background for the primary

social adaptations which few small-family homes can ever hope to set up, and which few large-family homes are qualified to supply. To be sure, the neighborhood life in sections in which there are several cultivated families is sometimes able to provide something of a substitute, but it is to be noted that such sections are usually the most earnest advocates of the kindergarten. The tenement neighborhoods, with their swarming children, are apt to provide simply a social jungle in which child individualism runs rampant. The kindergarten is or should be the dominant feature of the primary school. The present tendency to characterize the period as "kindergarten-primary" is a happy augury.

FREE READING.—In the second place, the process of teaching children to read, in its early stages, should be related to the actual experience of the children concerned, and in its later stages the books supplied to the children should be rich in informational content. Experimentation shows that children learn to read most effectively and economically in that way rather than by perusal of the history of the feuds of the family cat with the rodent pests of the household, or of the doings of the phonetic Dan, Fan, and Nan. If the school will come to realize that the essential purpose of teaching children to read is to teach them to desire to read rather than to develop proficiency in oral reading for exhibition purposes, it will provide, even in the primary-rooms, an abundance of free reading, books of all grades of difficulty which individual children can use, as curiosity and their newly acquired ability prompt.

READING-ROOM.—Third, every school should center about a library or reading-room plentifully stocked with children's reading of an informational character as well as with child literature. In the high school and junior college, this library may well contain some material of a somewhat formidable character. If foreign language is in the program, then the library should have an abundance of informational material in the languages taught. Children should be released for free reading whenever opportunity serves, and we shall find many such opportunities. The pu-

pils should have free access to the shelves and not be inhibited by the formalism of the typical library routine. Doubtless this practice will result in the loss of some books but loss can be reduced to a minimum, and the comparatively small annual cost traceable to this item is, after all, a productive cost. Every such room should be in charge of a teacher especially qualified by natural gifts or special training for the purpose.

INFORMATION MATERIAL.—In the third place, the school should furnish an abundance of extra-classroom informational and other educational stimuli, of which the following are illustrations.

The thoughtful and resourceful room teacher maintains a bulletin board on which she collects from time to time a wealth of clippings and pictures of an informational type calculated not only to add to the pupil's apperceptive mass but also to arouse cultural interests of various sorts. The elementary-school reading-room especially should emphasize this feature. Most high-school classrooms can effectively serve the same purpose, and of course the high-school library can elaborate almost indefinitely. Even in the junior college, with students who are high-school graduates and in one of the subjects supposed to be the least susceptible of this kind of elaboration, namely modern language, the bulletin board has been found to be a popular and useful aid.

Perhaps the most comprehensive of the schoolroom subjects in its service of educative adjustment is geography, and, because of its very comprehensiveness, it is singularly dependent upon the building up of an extensive informational background. It is a sheer impossibility to teach geography effectively with a single text or series of texts. Hence, there should be presented to the pupil, especially in the elementary school, an abundance of geographical material apart from the textbooks and outside the geography period. Before the days of rolled-up maps, when maps were a familiar and permanent feature of every schoolroom, hanging always in plain view on its walls, the pupil acquired a foundation for geographical thinking which is seldom found in

the modern school. Whenever the pupil looked up from his work, his eyes rested on maps which exhibited the main features of the earth's land forms and political divisions. Before long he had acquired a series of visual images to which much of his geographical thinking would naturally refer. Not so with a pupil whose visual imagery in geography is the vague and uncertain thing which has been acquired by occasional glances at small and inadequate maps in the textbook and rare glimpses of maps occasionally and for brief moments unrolled from the cases on the wall.

What applies to geography applies with equal force to charts, tables, lithographs, and the like, illustrative of history, mathematics, natural science, and public health.

PLAYGROUND.—The school playground is of course an obvious illustration of the extra-classroom appurtenances which contribute to the pupil's apperceptive mass. It is hence a mistake to think of the playground as being valuable only for physical-education purposes. If well conducted, it furnishes perhaps the most essential segment of the pupil's experiential background and thus contributes heavily to sane adjustment in cultural lines which seem remote. Similarly, it is one of the most available resources for the fundamental correction of perverted experience.

CONSTRUCTIONAL ACTIVITY.—It is a commonplace to note that the growing child, well up into adolescence, requires a deal of constructive activity. Left to himself, the normal boy is always making something. The rural or village home is apt to provide an abundance of such opportunities, but not always. The large city home seldom does so or can. The modern school attempts to meet the need in its manual training, but classes in manual training meeting once or twice a week at set periods can accomplish little although they may accomplish something. Rather should the school shop be open all day and before and after school for boys who find opportunity to work there, and this should continue throughout the school career, from the time when the little boy wishes to make a "scooter" of his own until the time when he uses

the engine lathe for the construction of a piece of apparatus which he wishes to use in his voluntary project in physics. The parallel opportunity for girls will readily suggest itself.

EXTRA-CURRICULUM ACTIVITIES.—The recent movement which has appropriated the name of *extra-curriculum activities* is decidedly well calculated to serve the purpose which we here have in mind, provided it does not degenerate into a series of mere public-entertainment enterprises for the solace of the tired business man, and provided it is not commercialized onto a basis of academic credits.

BUILDING A RICH BACKGROUND IS NOT LEARNING.—Psychologists are wont to conceive of learning as a process of building up associative bonds. That is true enough of the process of establishing the apperceptive mass which is the foundation of true learning. But learning which constitutes education is in the form of specific adjustments. Apperceptive mass is one of the conditions of learning but it is not learning, any more than innate mental capacity, which is another condition, is learning.

To repeat the schoolmaster's maxim: "We are continually underrating the ability of children and overestimating their experience." The rich and varied experience-getting which we have urged as our sixth fundamental to operative technique is the appropriate method of meeting the requirement.

With these underlying principles in mind, we shall now turn to the discussion of each of the five types and to the teaching and study peculiar to each.

CHAPTER XI

COURSES AND UNITS IN PHYSICAL AND SOCIAL SCIENCE

THE learning process in the science type is essentially *reflection upon experience* in the search for *meaning*. Of course experience is made available in book form and in other schoolroom instrumentalities or activities. The heart of the teaching, whether in the textbook or in the mouth of the teacher, is *explanation*. The outcome, the learning product, is a new understanding, a new attitude of intelligence toward the present environment or toward the historical past, or a new principle to be employed in trained thinking derived from the study of one of the organized sciences such as physics, chemistry, biology, economics, politics.

I

ENVIRONMENT.—Let us first attack the environment as the latter is presented to the young pupil, or, for that matter, to the untutored of any age. The immature pupil is from the beginning surrounded by a world of which he becomes increasingly aware as he grows older, and which calls loudly for explanation. Various aspects having been explained, they become manageable. Planning, which is the essence of intelligence, becomes possible. This world of the pupil consists in the first place of his own body and the similar bodies of other living things. There is likewise the inorganic world about him which is obvious to his senses. Finally, there is a perplexing world of social customs and institutions to which he must conform and to which he soon begins for better or worse to contribute. His adjustment to this environing world is far from being altogether a matter of understanding. Much of it is a matter of appreciation, of acceptance of value. But it is

those aspects which call for understanding with which we have here to do.

Now, as time goes on, the pupil becomes aware, or is made aware, of regions beyond his daily experience which he must approach through the use of imagination, and thus geography enters the program of studies. Similarly, he comes to sense that things were not always as they are now, that there is a Past to his world. Thus, history. His experience of the world about him is direct; of regions beyond the home town his experience is chiefly vicarious, and of the Past wholly so. Hence it is desirable, if indeed it is not essential, as a problem in administrative technique, that several distinct courses should be organized rather than a single comprehensive course to cover everything from the weather and prehistoric man to how people live in China. The common sense of systematic procedure in any field is "divide the fire in order that you may the sooner put it out." Such procedure is sometimes called "business-like," but it is just as much a characteristic of competent teaching and school management as of business. The foregoing brief analysis suggests the broad division points, at least in principle.

The practical and thoughtful schoolmaster has long attempted to approach this early educational process directly and to explain the pupil's surroundings to him without an intermediate process of first teaching him the sciences which may be utilized for the purpose of intellectual attack upon the world. Such a direct approach is found in what used to be called "natural history." The "nature-study" movement was a similar effort. Again the "general science" program, when it proposes to interpret the phenomena of everyday life, conforms to the principles of its predecessors.

The learning of science, as distinguished from learning the world, emphatically has a place in the field of general education and we recur to it later, but it is a different place. The educational objective at the natural history level is *adjustment*; at the organized science level, it is *adjustability*.

THE UNIT IN GENERAL SCIENCE.—Hence the problem of course organization in general science is a search for the comprehensive and significant aspects of the environment in the field being studied—*comprehensive* in that each such aspect explains a great deal and *significant* in that it is important and essential.

For example, "The Water Supply" is such a unit. Let us analyze.

The unit is a significant aspect of the world of well-nigh everybody who lives in civilized society. It is comprehensive, for it not only makes intelligible a picture of the daily life but it also explains much of community life and furnishes an essential part of the background for later studies and school activities. It is inclusive of a whole aspect and not a fragment. The contrasting approach is often a study of the principles of hydrostatics and hydraulics and of the practical application thereof in pumps of different kinds and in systems of gravity distribution. Under the lesson-learning technique, it is often a matter of chance whether or not the pupil really masters the principles themselves. Granted that he masters the principles, it is still a matter of chance whether or not he grasps the application to an understanding of this or any other aspect of the world of reality.

ELEMENTS.—Now selection of a unit like this and direct learning of the unit requires mastery, not of all the principles which might grow out of the unit or be associated with it, but of the elements which enter into the understanding which is the unit conceived as the teaching and learning objective.

For instance, the general mechanical principles upon which force pumps operate will be one such element, but neither a study of pumps in general nor a study of the behavior of liquids under barometric pressure. In the former case, we use the applied principle of the force pump to establish an attitude of intelligence toward a familiar body of experience; in the latter, there would be only the accumulation of a meager body of acquired information in elementary engineering, or in hydraulics, which tends soon to become mere content in memory.

It may and probably will later become useful to set up the unit "Pumps" in the field of practical arts as a comprehensive and significant aspect of the mechanic arts environment; and units in the field of hydraulics and hydrostatics in physics, not as a means of understanding the water supply but rather as a means of interpreting the behavior of all liquids.

Another element will be an elementary notion of water pressure, so simple that it is hardly more than a trivial extension of the common experience of all pupils, and a further notion of the behavior of liquids in pipes under pressure.

Other elements will be concerned with the distribution of water through street mains, house connections, and probably the standpipe. Note, however, that the element *metering* does not imply an engineering study of the construction of meters.

Thus we have a unit selected, stripped of all that is non-essential to the educational purpose in view, and its elements identified. Set up in the teacher's plan book, it would look something like this:

The Water Supply

1. The pumping station
2. Street mains
3. House connections
4. Pressure
5. Metering
6. Standpipe

Now to the uninitiated this layout looks so simple that two or three class periods at the most or even an hour or two of descriptive reading should suffice. It is true indeed that the good teacher should be able to give a clear descriptive account in fifteen minutes or less. That is the *Presentation* in the teaching procedure.¹ One of the practical tests of a workable unit is that it should be capable of such brief presentation. But such a brief descriptive account does not result in mastery. The actual learning which

¹ See chap. xiv.

constitutes the new attitude requires a somewhat lengthy series of classroom activities in the *assimilation* stage of learning.²

These elements thoroughly grasped, one after another, constitute an intelligent attitude toward the Water Supply, in contrast with that attitude which sees this whole aspect of environment only as highly useful taps in the bathroom and in the kitchen sink, with a vague awareness that there is a pumping station somewhere and an acute consciousness that bills are periodically rendered.

THE VOLUNTARY PROJECT.—Some pupils, during the assimilation period, will learn more rapidly than others. For these, a selection of voluntary projects associated with the unit should be made available, and individual rapid learners may each choose such a project for further study and report. For example, the mechanics of the water meter, which is no part of the learning of the unit itself, may still constitute a suitable project, and so with a great many others, some of which may well serve as introductory to the later physics course.

WHAT A UNIT IS NOT.—A certain type of teacher, preoccupied with special knowledge of the field in which the unit occurs, is sure to be troubled by the fear that pupils will not understand unless all the physical and mechanical principles which the engineer requires are first taught. "How can they understand pressure in the mains, unless they are first convinced that water always seeks its own level?" And an endless variety of similar intellectual obstacles. The full meaning of this eruditional attack on educational problems is that the pupil must be fully educated before education begins.

Another type of teacher wishes to "include under" the unit everything he can think of *about* the water supply—the chapter-heading motive. Not only does he attempt the impossible task of making engineers and physicists out of early secondary pupils, but he likes to discuss the sanitary and economic aspects and the methods used by the ancients. He forgets that his pupils after all

² See chap. xv.

can read and that the accumulation of wisdom will not end with his course. The unit may undoubtedly prove to be either an element or a guide-sheet item in sundry studies of community life, public health, public utilities, and so on; and the common denominator of all such is the principle that the water supply itself must be in the minds of pupils as a veracious picture of an intelligible reality.

Still another teacher is scandalized unless the pupils can reproduce all the information associated with the subject, at least all that which they have encountered in their studies. For this purpose, he innocently drills "in preparation for examination." The factual material which has gone into the experience of the pupil who has thoroughly learned the unit will tend to abide as memory content, and if it does not he will know where to go to recover essential facts.

THE UNIT AND ITS ASSIMILATIVE MATERIAL.—The unit statement itself, as well as the understanding for which the unit stands, is simple, divested of extraneous matter, trenchant. The experience-getting out of which the new understanding arises is on the other hand extensive, necessarily varied and diffuse, broad enough to meet the experiential needs of all pupils, detailed and specific enough in the instructor's oral teaching to meet the requirements of individual pupils. Such is the assimilative material upon which the unit is based. The unit organization of the course plus the assimilative material on the several units constitutes obedience to the maxim, "Not many things but much." Much of the assimilative material will pass out of memory when it has served its purpose; portions of it which have constituted the salient points in the experience of the individual will tend to abide.

The assimilative material is frequently mistaken for the unit, and the vain attempt is made to teach experience, to teach the assimilative material instead of teaching the unit in its elements and finally the unit itself. Of course the result is merely a content in memory which is usually fleeting and never a modification of personality which constitutes a behavior pattern.

RESULT OF MISCONCEPTIONS.—The conspicuous outcome of such misconceptions of the nature of the unit is that an unconscionable amount of time is consumed. Out of a list of perhaps fifteen units, six or seven will be worked out in the course of the year. The thorough learning of a unit requires time, as well as energy and effort on the part of both pupil and teacher, more time than is commonly thought necessary when the objective is merely a passing grade on some kind of performance; but neither the time needed nor the time available is endless.

II

IN THE SOCIAL STUDIES.—Perhaps the most valuable contribution which has emerged from the recent period of concern for social studies is the *Community Life* course located at junior-high-school level or earlier. If the course were entitled simply *The Community*, the designation would perhaps be more accurate.

Now this is distinctly a course at the natural-history level of the social sciences. The community, especially the local community, is the most obvious aspect of the social environment, unless we except the family, and the natural-history aspect of the family is learned at home if anywhere.

The modern community is a rather complex product of societal evolution, and we exist within the community in fully as critical a sense as is true of our existence within the physical world. And yet most people take the community for granted, much as primitive man takes the physical world for granted. Such people fail to see meaning in the community, fail to see the latter as a system of relationships capable of being understood and therefore managed. How often are we inclined to say to the rebellious in the presence of community disaster, "What could you have expected?" Truth to say, these friends seem to be completely unaware of any cause-and-effect relationship in the social phenomena which irritate them.

Hence, in setting up the course, the first point to be borne in

mind is that we are concerned with a series of relationships to be understood and not with a mere descriptive account; and, second, that the course is to give opportunity for learning the community and not the sciences which have grown out of the study of society in general. In the fully rounded and integrated program of study there is decidedly a place for the fundamental principles of economics, sociology, and political institutions, just as there is a place for similar courses in physics, chemistry, and biology; but these come later at senior-high-school and junior-college levels.

THE UNIT IN COMMUNITY LIFE.—Precisely the same mistakes are likely to be made in organizing courses, or in writing textbooks dealing with the community as such, which we found in courses in general science. See especially notes above on the voluntary project; on what a unit is not; on the unit and its assimilative material; on results of misconceptions. The tendency is for the teacher or the textbook writer to attempt to cover everything he can think of which is related to social existence. One text which I have examined covers a range which reaches from “swat-the-fly” campaigns to the organization of Congress. The result is an utterly inadequate descriptive account of what goes on in society at large rather than an exposition which is calculated to generate series of understandings of the way in which the community has come to be put together. Specifically, the following types of errors tend to be made.

In the first place, the community is hopelessly confused with the civil state, and with the municipality in its capacity of minor civil division, a function which the American city sometimes serves and sometimes does not. Thus, the course tends in part to become civil government, and even the elementary aspects of the latter constitute a separate course.

Again, with attention focused on all that goes on in the local community, the machinery of banking, of commerce, of transportation is included, and thus a hopelessly tenuous course in economics, or even in business management, is set up, in much the

same fashion as the course in general science has sometimes ambitions to become elementary engineering.

Similarly, the issues between capital and labor, social service administration, and sundry other questions generously entitled "problems in democracy" are introduced.

Finally, the course-maker becomes aware of the abundantly important item of health and so a series of what are really health courses are formulated as units.

Now, if we look upon the community, especially the local community, as being decidedly a comprehensive and significant aspect of the pupil's environment; give heed to the development of attitude in which the pupil comes to see the community as an entity which has meaning; and forego all the studies and information which are related to society in general, we might come out at a series of units which would be something like the following:

1. Diversification of vocation in order to supply our needs.

But not the whole history of evolution from the hunter, through the mediaeval manor, guild craftsmanship and home industry to the factory system. That is a problem in organizing courses in history.

2. Communication and transportation to make living together possible.

But not the mechanics of the telephone, telegraph and radio or of the locomotive, nor yet the relative advantages of the railway and automobile.

3. Diversities in population—the melting pot.

But not the history of immigration nor the ethnology of our population elements.

4. Community health.

But not talks on personal hygiene nor the theory of contagious disease.

5. Policing the community.

But not a study of crime, of penology, or of the detection of crime.

6. Fire protection.

But not engineering questions connected with the maintenance of the fire department.

7. Community recreation.
But not the whole philosophy of recreation as a personal need.
8. The City Beautiful.
But not a course in aesthetics.
9. Caring for people who are handicapped.
But not a course in social pathology.
10. How the community is controlled.
But not a course in civil government.
11. How the bill is paid.
But not a course in political economy.

ELEMENTS.—Each one of these units stands for a significant and comprehensive aspect of the community as a social organism. The mastery of each of them in succession would go far to make the community intelligible as an entity to which the operation of cause and effect applies as truly as it applies in the physical world. Nevertheless, the several units stand vaguely as teaching objectives until we think out the essential steps in developing the understandings to which each corresponds. As illustrative of the element organization of each let us take Nos. 10 and 11.

In the case of No. 10, probably the first notion which should be put into the minds of the pupils would be a picture of the chaos which would result if there were no control whatever, if everybody could do exactly as he pleased without regard to the similar activity of others.

It is commonly said that we are governed by "public opinion," and that is of course true. We get a long way from the chaos of anarchy when most people are willing to be decent and when public opinion is intelligent rather than ignorant.

People who are willing and able to be good citizens are such because they have been well brought up in good families and good schools, and because agencies like the church and the press keep them informed and under good influence. But we should not get along very well unless there were some agency which could conduct community business and prevent unruly people from interfering with the rights of others. So we have the local government.

Hence the unit as set up for teaching, before the guide sheet⁸ is worked out, would look something like this:

How the Community Is Controlled

1. What would happen if everybody did as he pleased?
2. Public opinion and good citizenship.
3. The family and home.
4. The church.
5. The press.
6. Local government.

In the case of No. 11, we have a unit which is very near to being what the last unit in a course should ideally always be—the climax, “a clincher.” It serves that purpose in this course and it is also the introduction to a later course in Economics or in Political Economy, just as some of the units in general science serve as background to physics, chemistry, and biology.

Now, despite lifelong experience in buying and selling, and to some extent in paying taxes, people are apt to be superbly unaware of the function of exchange in making community life possible. So the initial elementary understanding seems to be the notion that we all get along and are prosperous through producing either goods or services and selling them. That is perhaps obvious enough to adults, but it is far from obvious to many pupils at junior-high-school level. What is obvious to comparatively few adults even is the principle that there must be a buyer for every seller and that buyers in general must also be sellers. Hence the “com” in “community” and the term “purchasing power” which has come to be so fascinating to the modern business man.

But while many people, like merchants and manufacturers, physicians and lawyers, and industrial workers, sell their goods or services in the open market to others who are willing to buy, other people like teachers and clergymen and city employees must be paid through public contributions like taxes or pledges.

And so we can enjoy a good community life only by paying for it. We should not expect to go to the theatre for nothing or to

⁸ See chap. xv.

have a new suit for nothing. In just the same way, we cannot have good schools or good churches or good city government unless everybody helps to pay in accordance with his means.

Thus this unit with its elements worked out would have the following form:

How the Bill Is Paid

1. We pay for some things by what we produce, or help to produce, and selling either goods or services in the market.
2. For every seller there must always in the long run be a buyer.
3. So the prosperity of one is bound up in the prosperity of all.
4. For some things we must pay in the form of taxes, or church pledges, or other contributions.
5. We can enjoy a good community life only if we pay for it.

III

OTHER ENVIRONMENTAL STUDIES.—There is clearly not space enough for a complete analysis of all the courses which belong at this level. Enough has perhaps been written to make clear the nature of the unit and to illustrate the process of analysis. Other courses which have the characteristics of environmental adjustment pure and simple are Health, Civil Government, Vocations, Inductive Geometry, Foods, Textiles.

History and geography, pedagogically speaking, seem to occupy a field by themselves. Without attempting to pass judgment on the classification of these subjects as social sciences, for the purpose of this volume history is history and geography is geography.

IV

THE ORGANIZED SCIENCES.—We turn then to the level at which the teaching problem is learning a science rather than interpreting the world which presents itself to the pupil's immediate experience. At this level, we find grammar, arithmetic, mathematics in general—excepting geometry taught as a deductive science—physics, chemistry, biology, human physiology,

nutrition, economics, sociology, the individual's financial relations, and political institutions.

Grammar and mathematics have characteristics which call for special treatment. Deductive geometry does not, so far as I can see, lend itself to unit organization. Intellectually, it is a discipline which differs in important aspects from the remainder of the field of mathematics. Educationally, the product seems to be training in a particular field.

The other sciences listed above, however, all of them conform to a single characteristic type: they are all assemblies of principles which are capable of being applied in *systematically thinking out environmental problems*. In that character, they contribute to the individual's ability to interpret a changing world as well as to his ability to interpret the world as it is.

THE EDUCATIONAL PROBLEM.—Now in the organizing of *courses* in science as distinguished from the identification of *units*, much depends upon the use in the economy of the school to which a given course is to be put, and here we can identify at least three types of purposes.

The course may be designed to contribute to the general education of the pupil, quite independently of the academic or professional future of the latter. This is of course the understanding of purpose which is held in this work.

It may be intended as an introduction to scientific courses in the same field in the University or in some particular university. In that case, the school must choose between perennial dissatisfaction on the part of the science department to which it contributes students and limiting its own courses to pupils of special attainment and interest in the field.

It may be a pre-professional course and so be self-limited to pupils who have made their vocational choices.

It is probably altogether in the interest of economy that high schools, especially large high schools, at the present stage of institutional development, should offer all three types of courses in some of the sciences to different sections of pupils. Whatever the

purpose decided upon, the principle of unit organization remains the same. The lists of units will differ, but if the courses are properly organized each unit will be a true unit.

THE UNIT IN SCIENCE COURSES.—The unit here is a comprehensive and significant principle or complex of principles and the meaning and bearing of the terms “comprehensive” and “significant” are the same as before.

The veteran teacher of science has often reflected, “If I can get these pupils to learn just three things, or perhaps five things, neither they nor I need worry about the rest.” There are always more than that number to learn, but still the veteran is right: he has acquired the largest part of method which is selection, concentration, and organization. He has been thinking in terms of units of learning.

Thus in chemistry, the unit *oxidation*, as a step in the chemical thinking of the non-professional person, is not only comprehensive because it carries a great deal with it by way of implication, but it is extremely significant for the reason that but little chemical thinking could be done without it. Whether or not this unit as a matter of chemistry is as important as the student of teaching thinks it is the chemist must decide. So it is with all the sciences. But the principle of unit selection itself is a matter of pedagogy and not a matter of chemistry. By contrast, descriptive material relating to the element oxygen, for instance, is scarcely teachable at all. It is readable and should form a part of the assimilative material for which the pupil is held responsible. But the mastery of the unit in the mind of the non-professional student does not imply learning all there is to be learned about oxidation. It does imply that he shall come to grasp the meaning of the process itself.

Similarly, in economics, *supply and demand* at once forces its way to our attention as a comprehensive and significant complex of principles to be understood, and thus taken into the intellectual life of the individual as an instrument of economic thinking. But the unit does not imply that the secondary pupil is to learn all

there is to be learned about the unit viewed as a topic. When we pass over for instance into a study of the mathematics of the supply-and-demand schedule, we leave general education behind and enter the professional field.

Again, in a study of our civil institutions, *liberty under the law* is an obvious unit to be taught and developed until the meaning comes clear, whereas the pupil might conceivably become erudite in all the liberty documents from Magna Charta to the Nineteenth Amendment, without ever once grasping one of the essential principles which makes the whole story worth learning at all.

NUMBER OF UNITS.—If the principles thus set forth are followed intelligently by teachers who are sufficiently familiar with the several academic fields, there will seldom be found more than fifteen to twenty units in any one of the several science fields, and continuous experimentation under teaching conditions will tend to reduce rather than extend the number. Experience tends to show that the tyro develops an unduly large number of units, usually because he has not learned to identify what is really comprehensive and significant, or else because he does not distinguish between units, elements, and items of the guide sheet for assimilation. In some sciences, notably biology and the social sciences, the legitimate number of units tends to be less than in physics and chemistry.

In organizing courses, the teacher who has grasped the principles of unit organization still tends to fall back on what he calls *minimal essentials*. He looks at the whole field of chemistry, for instance, as he knows it from the vantage point of his university degree, and then selects what he conceives secondary pupils "ought to know." The attitude is, as I think, wrong. The science as a contribution to general education should be looked upon as being complete in itself. It is quite true that it is at the present stage impossible to work out satisfactory objective criteria which are capable of defining exactly the boundary line on one side of which lies general education and on the other professional sci-

ence. Nevertheless, with the purposes of general education in mind as being adjustment to the environment which is within the apprehension of all plus the intellectual tools for interpreting changes in that environment, sound judgment will go far to distinguish between one field and the other.

Naturally, in courses which are pre-professional in character or in principle simply introductory to university courses, the scope of the unit organization will be determined by the requirements of later academic study.

ELEMENTS.—No lengthy discussion of the element structure of the unit as it is organized for teaching is called for here. The principles are the same as those which have been explained in connection with the units in courses at environmental level. In general, the elements are the minor understandings out of which the unit understanding emerges. They correspond to the "points" in which the good expository writer or convincing speaker organizes his discourse. They are not *parts* of the unit, nor are they mutually related understandings which classify under the unit caption. In the latter case, the unit ceases to be unit and becomes *topic*.

In numerous unit organizations which have been presented to the author for criticism, mistaking a topic or chapter heading for a unit is the most common error. Occasionally, the unit as thus conceived becomes merely the name for a block of talks to the pupils. Numerous text-books, "designed for use with the unit plan," merely substitute the word "unit" for the word "chapter."

NUMBER OF ELEMENTS.—The number of elements in a science-type unit, whether at the environmental level or the organized-science level, is in the nature of the unit itself small. The element is comprehensive and significant just as the unit is. The unit represents a big and important feature of the course. The element is not a feature of the unit, but rather a step toward the learning product which constitutes the unit. If there are too many such steps, the pupils, and very likely the teacher, lose sight of the unit long before they reach it. Sometimes there will be

only two or three such steps. I can seldom find more than seven. The reasons which lead the teacher to formulate an unduly large number of elements are chiefly to be found in misconceptions of the nature of the unit which we have perhaps sufficiently discussed. But there are other reasons.

Of the latter, perhaps the most conspicuous is a tendency, after having selected a valid unit, to include as elements what is essentially assimilative material, specifically items of the guide sheet. E.g., the element organization for *Supply and Demand* would be:

Supply and Demand

1. Abundant supply causes prices to fall and thereby stimulates demand.
2. Short supply causes prices to rise and thereby stimulates production.
3. Supply and demand tend toward an equilibrium.

Now a certain teacher tends to formulate the first element thus:

1. Abundant supply causes prices to fall and thereby stimulates demand.
2. Unmetered city water causes excessive demand.
3. Abundant food in a rich country generates a wasteful demand.
4. Falling cost of manufacture in automobiles makes people desire cars who would have before thought ownership impossible.

He thus has four elements instead of one and at this rate will have twelve elements for the unit. He might equally well have fifty. Further, 2, 3, and 4 are simply applications of 1 and as such they are valuable study material but not elements.

Another teacher is so disastrously meticulous that he cannot refrain from introducing all known exceptions and qualifications. This is the thoroughgoing professional-school attack, the purpose of which is to develop expert competency and not merely the attitudes of intelligence which are a feature of general education. The secondary pupil is of course merely bewildered.

Aside from the fundamental misconceptions of the unit itself, these are the chief errors which have been noted in the element structure.

V

UNDERSTANDING AND NOT INFORMATION THE OBJECTIVE.—The critical test of any unit in the science type is, Does it tend to contribute understanding rather than a descriptive account?

The essence of education is in the behavior patterns which it sets up, either actual in the form of special abilities, or virtual in the form of attitudes. Now an understanding, an insight, is in its nature a behavior pattern, while a descriptive account leads to such a pattern only by chance. The function of education is to modify the individual's outlook and develop right attitudes toward the world and toward life. Unless a pupil is personally different at the end of a course from what he was at the beginning, the course has been a failure so far as he is concerned. Hence, if the course is organized in science-type units, a pedagogical problem is set up which is at least capable of systematic solution. Otherwise, no educational problem as such is in the picture.

If a descriptive account is all that is needful, then there is no occasion whatever for any of the material which is discussed in this chapter in the school program at all. Books and newspapers are written and can be read. The radio is perhaps in most homes or soon will be. If information is all that is needed, information is at hand in abundance.

But in truth, information alone is about as likely to do mischief as to do good. The welter of pseudo-science which is abroad in the world today is an entirely new kind of opportunity for the demagogue and the charlatan. Thorough training in the sciences to the limited extent implied by general education and secondary schooling is the corrective and that training requires the organized school and the competent, effective teacher.

LENGTH OF COURSE.—This chapter has dealt largely with units, and with courses only in so far as they are involved in the

definition of units. It remains to reiterate an objective to be aimed at in our conception of courses, not only in this type but in the appreciation and practical arts types as well.

The course is properly not such a division of a field as can be covered in one year or one semester. It is rather the definition of a part of the program of study of general education. When we have succeeded in justifying and organizing all courses, we shall have defined the secondary school, and thereby have made progress in the direction of reducing the task of the schoolmaster to an exact science.

Actual and thorough learning in the science type requires patience in the teacher and diligence in the pupil and time for both. The learning involved in the school studies which we have been discussing is a very recent acquisition of the race. We must not be surprised if the individual is slow to learn. In a given course, there will be some pupils who will master the several units in less than a school year, either because they are natively rapid learners or more likely because they come to the course with a superior background. Others will require more than a year. More or less, learning and not time spent is of the essence of the situation. To define the course administratively as nine months or four-and-one-half months is to make inevitable credit on a performance basis instead of on a learning basis, half-learning, and lesson-learning.

CHAPTER XII

COURSES AND UNITS IN HISTORY AND GEOGRAPHY

IN TERMS of mental activity, history and geography occupy a peculiar place in the program. The social, physical, and biological sciences deal with a body of experience which is accessible to the pupil. So in another sense do mathematics and grammar. But history deals not at all with the direct experience of anybody and direct geographical experience is that of the explorer and traveler. Hence the two subjects require vicarious experience as the foundation of the learning process and they make large drafts upon the imaginative powers. Beyond all other subjects in the curriculum, in their very nature they require a wealth of pertinent and significant pictorial illustration. It is here, if anywhere, that visual aids are called for.

In terms of intellectual background, they constitute the matrix out of which most of the other sciences have evolved and hence they lie at the basis of much of the intellectual life of the individual.

History originally meant an account of any kind of inquiry. It was perhaps as much concerned with reports upon the ways of life of different people and upon observation of natural phenomena as with what we now call history.

Geography has not inaccurately been called the mother of sciences. Astronomy, geology, botany, zoölogy, meteorology, archaeology, and ethnology were all at one time within the domain of geography. Modern geography, or human ecology, appears to be the youngest of the children of the ancient mother.

Now, we do not go far wrong when we are guided in shaping the program of the secondary school by the order in which cultural material has appeared in the evolution of the race, provided we

are circumspect in our thinking. More than that, and more definitely convincing, is what any survey of the content of the all-important field of the social studies will reveal touching the immensely important apperceptive and organizing value of a fundamental and continuously expanding background in these two fields. There is little indeed in economics, sociology, politics, or indeed in literature and the fine arts, which is truly comprehensible or even acceptable apart from a conviction of the evolutionary character of society and of the determinative influence of that aspect of the environment with which geography deals.

Unlike the sciences discussed in chapter xi, however, texts and treatises in history and geography are prone to be mere narrative and descriptive accounts. The physical, biological, and social sciences are in their nature concerned with principles, and as such, however poorly their material may be organized for teaching purposes, after all there is something to be understood. New points of view, new attitudes, are of the essence of the treatment. Treatises in history and geography tend to be simply elaborate journalism which explains little. They sometimes indeed deliberately avoid prejudicing the reader by setting up no theories whatever. Schoolroom textbooks based on such treatises of necessity tend to be meager and scrappy. Hence the critical problem in developing courses in the field is the discovery of intelligible movements in history which help to make the evolution of society understandable, and of intelligible relationships of man to his geographical environment. Such movements and such relationships constitute the needed units of learning.

HISTORY

The reader will recall that history is one of the recent additions to the curriculum of the secondary school. Save for a traditional course in United States history in the old grammar school and for an occasional course which some college teacher found time to offer, there seems to have been little or no recognition of his-

tory as an important element in American education down to the early nineties of the last century. The period of acceptance of history as part of the curriculum of general education therefore coincides closely with the period of critical study of educational products and processes.

The early view of the objectives of history teaching implied simply memoriter conning of the pages of a textbook, in itself necessarily a meager and purely annalistic account of the past. If the pupil developed intellectual growth of any sort at all, his gains were purely fortuitous and accidental. Textbooks improved chiefly in their historical reliability, in their illustrations, and in the quality of the questions at the ends of the chapters. This conception of the teaching of history was that which we have found in nearly all the schoolroom subjects, namely, ground-to-be-covered and lessons-to-be-learned. There is little in such a course which could not equally well be acquired apart from teaching altogether. Whether it be desirable to bring the individual in contact with all the happenings of the past or no, we can feel confident of this at least: History cannot be taught that way for the simple reason that there is nothing to teach. The reader who has acquired an intellectual interest can no doubt learn many things and continue to do so indefinitely, but there is much in every field which can be learned and yet cannot be taught.

There is scarcely any of the subject-matter fields to which more attention has been devoted during the period of critical study of formal education. Some of the study has been done by historians who were essentially unaware of education, some of it has been done by educationists who had scant knowledge of history, and some of it happily by historians who were concerned with the use of history as an implement in the educative process. Out of the prolonged analysis there has, as it seems to me, emerged two conclusions in which most students of the group last named would agree: (1) That history is valuable in the process of general education chiefly because it contributes to an understanding of the present state of society; and (2) that, in order to be valuable for

such an educational purpose, history must be made intelligible and more than merely readable.

Thus history made available for educational purposes and taught in such wise that it can be made serviceable as background for the study of society is a thing which is quite different from history made available as one of the most delightful of leisure-time occupations and from history as a scholarly research pursuit.

I

COURSES.—Under the older conception, it seemed obviously proper to fit the entire historical narrative into the four-year high school as a series of courses which became standardized as Ancient history, Mediaeval history, Modern history, and United States history. As a sop to the Cerberus of meddlesome state legislators, who thought that pupils should be taught something about the institutions of their own country, the course last named was sometimes complacently labelled United States History and Civil Government. Teachers of physics and chemistry, mathematics and Latin, modern languages and English literature, thought well of the device, for it promised a cessation of raids on program space. General History was for a long time anathema as savoring of superficiality.

Now the ingenuousness of this four-part course consists in the principle that none of it would be of much value unless the pupil were to take it all, and nobody seriously expected that. The elective system and the school's paper currency stood in the way. Beside, the Ark of the Covenant would be profaned if the pupil's historical pursuits were carried on outside of the building which had been consecrated to a four-year high school.

SURVEY OF CIVILIZATION.—But note how popular courses entitled *Survey of Civilization* were suddenly to become! The old General History course was given another name and its scent promptly became fascinating, even in the nostrils of college history departments.

The *Survey of Civilization* was right. It served the pedagogical principles of the general before the detailed, breadth before depth, the fundamental before the accessory. It promised background without befuddling. If the pupil were to take the course at all, he would presumably cover the field and acquire some notion of world development.

Now, if the Survey course is conceived as a complete record of the past compressed into perhaps a thousand or more short paragraphs, it can serve no good purpose whatever. The pupils can be compelled to memorize "in preparation for examination" and that is all. The story of the past is the longest story we have and those pupils who attain an intellectual interest in history will still be reading the story, as story, in the days of their retirement. But if the Survey is set up as a series of intelligible units, the pupils may be enlightened, though it is admittedly true that they may not all be able to place Tiberius Gracchus in his proper century even, or to list the Greek dramatists accurately.

And so a possible unit organization of the course might well be:

- I. How uncivilized man lived
- II. Civilization in the great river valleys
- III. Civilization in India and China
- IV. The brilliant Greeks and what they did for civilization
- V. The great road builders and law makers
- VI. The coming of Christianity
- VII. The old civilization once broke down—barbarians again
- VIII. Another world religion
- IX. The Monastery and the Castle
- X. How the modern European nations got started
- XI. Europe spreading over seas
- XII. Kings and people
- XIII. America breaks away from Europe
- XIV. The coming of the factory
- XV. From slave to free man in all the ages
- XVI. The coming of science

In accordance with the principles enumerated in the last chapter, the Survey ought not to be thought of as a fragment nor as a grade placement, but rather as the definition of a portion of the field of general education. It ought not to be thought of as belonging to any particular year of the school life. Ideally, whenever a section of pupils seems to be ready, they should embark, even at fifth-year level, and even if there is another section which will not be ready until the ninth year. The course may well require more than one school year for some sections.

EUROPEAN HISTORY.—Outside of our own national history, that portion of world history which has the most immediate relation to our society is clearly that of western Europe. That is the reason for the necessity which has sometimes been felt of introducing United States history with a brief treatment of what is called European Background. Most of us were Europeans until early in the 17th century and many of us in all essentials are still Europeans.

Nevertheless, a prolonged reading of European history by nations could have little or no systematic effect in the direction of the educational purpose which we have in mind. It might contribute information and a modicum of erudition, but it would be likely to contribute understanding and insight only by chance, and even so only if it were to appropriate the whole available program space. Such study in the University may well refine and extend understandings which are solidly established in the School and it no doubt is essential in the equipment of the professional historian. But here as elsewhere university and professional study are one thing: general education is quite another.

Now if we thus look upon European history in terms of its purely educational functions, and ask ourselves what needs to be studied and understood, for the sake of the light which can thus be thrown on the world of which we are a part and on the question how that world has come to be what it is, the comprehensive and significant aspects of the process of evolution are fairly obvious. They are in general the developments which took place in

western Europe after the final collapse of the old Roman Empire and which were characteristic of the region as a whole. Without attempting a final settlement of what the units should be, the list which follows would go far to enlighten the pupil.

- I. Barbarism and the collapse of ancient civilization
- II. Feudalism
- III. The conflict of Christian and Mohammedan
- IV. Contact with the East and Antiquity through the Byzantine Empire and the Crusades
- V. The Great Awakening
- VI. Rise of the national states
- VII. Expansion and colonization
- VIII. The fall of absolutism
- IX. The Industrial Revolution
- X. Balance of power and militarism
- XI. The Great War

Be it remembered that each of these stands for an understanding of something that happened or of a past organization of society and not for a narrative account. For example, the first unit implies an insight, a mental picture of forces like law and social custom holding society together so that most people most of the time were living in peace and security, a collapse of those forces, a long interval during which almost anything might happen to anybody save for the protection of the Church.

Be it remembered further that we are endeavoring to establish only a broad general understanding and attempting to make sure of that. As historians, we fully realize that there was nothing like a sudden catastrophe nor yet a sudden recovery. We are aware that the process began as early as 180 A.D. at least and that there were several intervals of ordered and civilized existence. We leave all that for university courses and for the general reading of those who develop an intellectual interest in history. Perhaps some of our more rapid learners and interested pupils will prepare supplementary papers on the Ostrogothic kingdom and on the empire of Charlemagne. Our primary pur-

pose is to avoid calling attention to so many trees that nobody will see the forest.¹

UNITED STATES HISTORY.—The culmination of history in the field of general education is the senior-high-school or junior-college course in *United States History*. The problem is to set up a course which in some measure explains the national society in which the pupils themselves live and which is still in process of evolution.

We traditionally find two courses, one at about seventh or eighth grade level, and one at senior-high-school level. The reason is to be found in the tradition that few pupils ordinarily reach the latter level, and in the well-founded belief that no pupil ought to leave school without some knowledge of the history of his own country. The original reason is rapidly disappearing, for the high schools are now reaching rather more than half of all young people of high-school age in Continental United States and the proportion who survive to the end of the high-school period, graduate, and go to college is rapidly increasing. In numerous local communities, most pupils go through to high school graduation as a matter of course. Is there any other good reason for a course at junior-high-school level or earlier, a reason which would call for such a course as a permanent feature of a well-integrated program? I think there is.

By the time the pupil has reached sixth or seventh grade, he is aware of an environment which begins to call rather loudly for an historical interpretation. Economic and political discussions are very much to the fore, if not in the family circle, then at least in the daily newspapers. He encounters all about him notes from American history—some of them highly mythical in character. He hears and reads very little of feudalism, of the Byzantine empire, or of the Renaissance; but he does hear much about Columbus, the revolt of the colonies, slavery, American wars, immigra-

¹ For a different organization of the field of the Survey and of European History, see Smith, *A New Approach to Early European History*, 1929; *A New Approach to Modern European History*, 1930, University of Chicago Press.

tion. Further, he is already engaged, or soon will be, in social studies which have an ideational background in American history.

Now, the elementary treatment and that which is found later are essentially a single course if thought of as defining United States history as an element of the program of general education. For purposes of administration, they are two courses.

ELEMENTARY COURSE.—Hence, a suitable organization for the elementary course might well be the list of units which follows:

A COURSE IN UNITED STATES HISTORY FOR THE JUNIOR HIGH SCHOOL

- I. Immigration: This unit is intended to serve the purpose of the usual chapters on the European background. It deals with the social causes having their origin in European conditions which have stimulated immigration in its several forms from the beginning
- II. Independence
- III. Establishing the Federal Government
- IV. The Factory System
- V. The Slavery Conflict
- VI. The Winning of the West
- VII. American Foreign Relations

THE ADVANCED COURSE.—Similarly, the advanced course, which ought to represent a final attempt to explain for late adolescents our American life and society, may be found perhaps in the organization worked out by Bailey as it appears in the first edition of this work.²

- I. Setting the Stage for Columbus
- II. The Expansion of the Old World into the New
- III. The Struggle for a Continent
- IV. The New World Breaks Away from the Old
- V. Making the Constitution
- VI. Testing the Constitution
- VII. Pushing Back the Frontier
- VIII. The Industrializing of American Life

² See also Bailey, *A New Approach to American History*, University of Chicago Press, 1927.

The two reminders which follow our description of the course in European history apply in essentials to these courses in United States history. The units stand for a series of interpretations which are calculated to generate understandings in the pupil and not for a series of narrative chapter headings.

II

CRITICISMS.—Several criticisms of this attempt to set up history as a series of understandable units have been proposed.

CHRONOLOGY.—Of these, perhaps the most conspicuous is that it ignores chronology, and it is held that a sense of sequence in time is of the essence of an intelligent attitude toward the past. There is of course force in the contention. Two circumstances ought, however, to be noted.

In the first place, the trend of the succession of units is on the whole in chronological sequence.

More than that, the development of each unit is in its nature evolutionary and therefore in chronological sequence.

But the heart of the matter consists in the principle that mere succession in time is not in itself evolutionary sequence. The latter is altogether a matter of succession in events between which there is historical relationship. If there is no such relationship, mere chronological sequence means nothing whatever.

It ought to be noted however that developments do occur within the stream of time as a necessary circumstance and that each event is dated. Hence, viewing history as a whole, a considerable series of significant dates drilled into the memory content on pure-practice principles constitutes a mental reference table which is of essential importance in the structure of historical understanding itself.

OVERLAPPING.—Some teachers feel a sense of waste effort in the overlapping which occurs, and ought to occur, not only in the successive units of a course but as between courses. For example, in the first course in United States history as suggested on page 207 the Slavery Conflict is a unit by itself, but several guide-

sheet items in The Factory System would probably refer to slavery and it would probably be an element in the unit The Winning of the West. Similarly in the course organization suggested for European history there would necessarily be a good deal of overlapping in guide sheets and perhaps elements for Nos. III, IV, and V.

If, in the latter case, the memorization of the narrative account were the objective, there would be no excuse for overlapping, but such is not the purpose. On the contrary, the purpose is at one time to secure some adequate elementary notion of the conflict between two militant world religions as it was staged in the seventh and eighth centuries, and at another time other and different notions which center around the contact of crude and barbarous western Europe with the still-abiding civilization and culture of the East and Mediterranean antiquity. Again, in American history, to understand the contest over slavery is one thing; to see the contest as one of the factors in the settlement and exploitation of the West is another.

LEAVING OUT MUCH.—Those teachers who are deeply concerned with history as a narrative of events are naturally reluctant to leave out anything. Hence school and college textbooks in the form of collections of scrappy paragraphs, running to several hundred pages, which explain nothing and delight nobody. The purpose of such books being what it is, several volumes, written as the great historians have written, would be required in the place of each.

Truth to tell, the essential story of the past, contained in great movements and abiding achievement, which is capable of enlightening the pupil, is comparatively brief. The larger story is full of incidents and even of great episodes which had their day and vanished explaining little or nothing, least of all our present civilization. It has of course much which is of concern to the professional historian, the economist and political scientist, the jurist and sociologist. But the secondary school has no concern with professional training.

What to select, in terms of our cardinal principles, is a matter of historical judgment. The present volume for instance has no place for either the French Revolution or Napoleon as units in the secondary school, although both are capable of being understood and are therefore capable of being organized as units.

The French Revolution as an element in the unit which is entitled *The Fall of Absolutism* has its necessary place, and other elements are the failure of the Stuart kings in England, the collapses of the Russian Monarchy and of the Hohenzollern state, and the liberation of Italy—a study which brings nearly three centuries within the scope of a single understanding. Taken together, the three explain much and further they disclose different processes in the disappearance of autocratic government.

On the other hand, the Napoleonic episode left few traces indeed save in the French republic. However, Napoleon may appear either as an element or as guide-sheet material in the unit *Feudalism*, provided the teacher wishes to note the final catastrophe of feudalism in the Napoleonic conquest of the Germanic states and Italy; and in the *Fall of Absolutism*, if the teacher thinks it worth while to note the tendency of revolutions to produce men like Napoleon. The pupils will encounter Napoleon in their reading both in history and in literature. In the unit *Biography in literature* they may perhaps, some of them, be introduced to the extensive Napoleonic material. But in the end Napoleon for our purposes is dramatics and not history. If the historian who is imbued with the principles of general education and of selection and organization of content for teaching thinks otherwise, we do not question his judgment.

READING AND HISTORICAL INTEREST.—Those who are still concerned about the historical narrative may well remember that the development of the units implies a great deal of reading in the assimilation period and further some individual pupils in any well-conducted course will not only themselves carry on independent explorations of the past but many of them will present worth-while papers to the class. More than that, history as narra-

tive, and interpretation as well, appears again and again in other studies—in geography, in economics, politics and sociology, in literature and the fine arts.

III

THE UNIT IN HISTORY.—The learning-unit principle as applied to history has been dealt with at length in all the foregoing discussion of courses. Perhaps the notion is sufficiently clear. Nevertheless, the narrative conception is so deeply rooted that teachers who seemingly have clearly grasped the unit principle betray themselves by organizing their own courses in palpable topics rather than in units. A correspondent, for instance, raises the question, "Why is not the Revolutionary War as much of a unit as the French Revolution?"—referring to the first edition of this work.

Now The French Revolution is the title of a possible understanding, an insight, in which there is manifest the collapse of a régime founded on absolutism, injustice, and oppression; a period of bankruptcy, anarchy, and terrorism; another period of personal rule and military aggrandizement; and the final emergence of a new and relatively stable society. All of these are related as a sequence in something that approaches cause and effect. Left to read about it, or to render daily recitations, it would be a rare pupil or college student who would be philosophical enough in temper to extract the true meaning of it all, but even rather young pupils can be taught the meaning, and thus a contribution to personal intelligence can be made. In the University, a full course is ordinarily given and all the foregoing greatly expanded and refined.

Now the American Revolution was not the Revolutionary War. There was a Revolt of the Colonies and Independence was established. Independence is a unit. It is capable of being accounted for and its processes are capable of being understood. The Revolutionary War, on the other hand, is not capable of being understood save as a series of problems in strategy and tactics and supply. It might well be a unit in some course in the field of military

science, but hardly in the secondary school. The story of the war contributes much in the reading which the pupils do on the unit Independence, and the associated biographical material is the basis for much of our national culture. But that is a matter of appreciation, a vital contribution to the value attitudes which help to build up the background of conduct. See chapters xvii and xx.

ELEMENTS.—Just as in the courses discussed in the preceding chapter, the development of a unit implies argumentation. There are always sundry points to be made, minor understandings, which being grasped in succession cause the major understanding, the unit, to emerge. Here as there, limitations of space forbid an extended study of each course. Examples can, however, be given.

THE COMING OF THE FACTORY

(Survey of Civilization)

1. In primitive times each family made all their own goods, but they could not make much that way.
2. Civilization began to appear when people learned to specialize, for more could be made.
3. For centuries each craftsman carried on his own specialty in his own home or shop.
4. Nearly two hundred years ago, because of the invention of the steam engine and improved water mills, it became possible to use power-driven machinery.
5. This made it necessary for home industries to be combined into great buildings called factories.
6. The workmen who before sold the goods which they made now came to be paid wages.
7. A great deal more could in this way be made and a great many more people could have what they needed.

THE INDUSTRIAL REVOLUTION

(European history)

1. The transition from home industry to the factory at first created a great deal of misery in unemployment, since the home market in Europe could not take up the product.

2. Rail and water transportation, however, led to larger markets and relief.
3. Hence the desire for colonies.
4. In due season, industrial society became divided into the capitalist class and the wage-earning class.
5. Hence the labor-union movement.

THE INDUSTRIALIZING OF AMERICAN LIFE
(United States History—advanced course)

1. English market requirements were largely responsible for separation.
2. Critical need of productive capacity—hence protective tariffs, stimulus to mechanical invention, rapid industrialization.
3. Westward movement and free land prevented most of the industrial misery of Europe.
4. The United States is a self-contained economic area—hence a great home market.
5. Industrialization was largely responsible for collapse of slavery.
6. Difference between English and American conditions have made differences between the respective labor movements.
7. Final result is immense productive capacity and better and better distribution of the product.

The element organization of these three units is typical of that which is required in all. In every case, the unit itself and its elements are in the form of understandings to be arrived at and not in the form of narratives of events. Each element is a point in the argument which develops the intellectual attitude which the unit stands for.

The three units which have been selected further illustrate overlapping, but the instance is one in which the treatment of two materially different phases of a single great evolutionary movement overlaps the treatment of the generalized movement itself. The three taken together probably go farther to explain our existing society than do any others which can be found in the whole historical background.

NOT THE ONLY UNITS.—The reader is reminded that the lists

of units selected are not the only lists which might be selected. They are offered as exemplifications of the principles of unit organization and not as determinate courses nor even as the best courses.

GEOGRAPHY

Unlike history, geography long ago established its right to a place in the curriculum of general education. Indeed, as curriculum material goes, geography is among the older portions. Like most other studies, however, it was long treated as mere memoriter accounts of names and places, almost the only bits of enlightenment being in map work and perhaps in the principles governing the change of seasons. Conversely, there is scarcely any subject matter in the curriculum which has longer been subject to the attacks of educationists, professional geographers, and academicians in sundry allied branches. In general, most such attacks here and abroad have been aimed at securing enlightenment regarding the surface of the planet upon which we dwell as well as information.

The history of attempts at better instruction has not been without a humorous side. In the presence of our devotion to local self-government and of our rooted belief that an ignoramus can be transformed into an "educational expert" by force of election to the school board, handwriting, spelling, and geography have been at a singular disadvantage. Handwriting and spelling represented the maximum intellectual attainments of the "practical men" who consented to sit on boards of education and award contracts, although their spelling was not infrequently "in their wives' names." Hence the innumerable instances of local statecraft applied to the adoption of spelling books and methods of penmanship. Texts in geography, however, commonly contain maps and illustrations. The local view frequently used to be that it would wreck the patriotism of youth unless the home town appeared in the map, even though a consensus of similar views resulted in maps which could conveniently be studied only with the aid of a reading glass. An instance once came to the attention of

the writer in which an influential board member in a considerable city prevented the adoption of a text until a new edition had been prepared which contained a cut of his lumber mills. No wonder progress has been slow and halting.

IV

MODERN GEOGRAPHY.—Modern geography in the terminology of the sciences is *human ecology*, that is, it is a fundamental and comprehensive study of man's relation to the earth on which he lives—to its topography and its resources, to its climates and soils, to its place relations and to the conditions which originate in its planetary nature. Nearly everything which geography describes and explains is also studied in economics or politics or ethnology, in botany or zoölogy or agriculture, and history makes large use of geography in attempting to understand the field which it cultivates. Now economics is concerned specifically with the organization of society for the purpose of co-operation in making a living; politics with the structure and processes of civil states; ethnology with the races of men and their cultures; botany and zoölogy with plant and animal life; agriculture with the cultivation of the soil. But all of them find their material somewhere *in situ* on the earth and none of them is fully comprehensible apart from the insights which it is the peculiar province of geography to contribute. Indeed we might go much farther and assert that nearly all outward human activity as fully intellectualized rests in the last analysis on geography. Our reclamation policy for instance would probably have been more effective and less wasteful if it had been planned by geographers as well as by engineers, and so with the layout of our railway system. Indeed it may well be that in due season the state lines in our American Commonwealth will be redrawn in accordance with geographical principles.

The rise of modern geography is an excellent example of a tendency to recover from the intellectual confusion which has resulted from the extreme specialization of the past half-century or

more. However that may be, it is certainly true that, in the development of intelligent and sane personality, foundations are laid in the general as contrasted with the particular, and that modern geography therefore is a part of the basis of the program of studies of general education.

The center of the educational problem as such is then the generation of geographic intelligence, an awareness of a relation of cause and effect in man's relations to the earth on which he lives. Thus, it is more important to develop a conviction of the reasons which explain why New York and Chicago have come to be great cities than to establish in the memory certain facts about them, apart from the insight referred to. The understanding being established, the essential facts go along with it. One "just knows" what they must be. Or if facts are not subject to recall, the pupil knows where to look for them. Again, it is more important to understand why certain state capitals make good seats of government and others do not than to memorize a list of the capitals, especially as the memorized list will probably be wrong before the pupil has occasion to use it in adult life. Once more, it is more important to understand why what is called the Mediterranean type of climate is apt to be the seat of an advanced civilization and culture than to remember where such climates are found. When the pupil thoroughly understands what that type of climate is, and what makes it, it is not difficult to recall where such regions must be.

FACTS AND ASSIMILATION.—Nevertheless, the pupil constantly tends to memorize reasons instead of memorizing facts. Here as elsewhere, learning always tends to be short-circuited by memorizing unless the teacher is critically aware of the process and vigilant to prevent it.

In geography as in other subjects, academic teachers, parents, business men, and others are not unjustly irritated and scandalized at the incredible ignorance of the simplest geographical information which graduates of the public schools sometimes exhibit. The effect of their anger, so far as it has any effect at all, is

to set up a vigorous insistence on facts and to verify the pupils' erudition by means of examination hurdles, or some similar form of test. The schools' response is to become cramming factories. The "facts" are available until they are forgotten and geographic intelligence is not available at all. Similarly the teacher is likely to be urged by the information motive. Convinced in his training school, he is nevertheless at bottom of the same opinion still. "They ought to know it." True, so they ought, but what he means is nearly always that the pupils ought to memorize bits of information in isolation, overlooking the principle of assimilation. Thus, what he gets is not even information.

Now there is scarcely any subject which has been more a matter of memorization than geography. When these pupils exhibit appalling ignorance in high school, it is not because they have failed to have due regard to facts but rather because they have in no true sense learned their geography. The courses which they have taken have very probably not been properly laid out, that is to say there has been nothing specific to learn. The school has not insisted on mastery; it has been content with acceptable daily performance. Very probably the pupil's training in his geographical background has not been sufficiently prolonged.

Geography is a science-type subject or it is nothing—at least so far as teaching is concerned. That being the case, the learning process is one of intellectual assimilation, the end-product of which is an awareness of how the world is put together. If there were something in a state capital which makes it eternal and unchangeable, then the list might well be memorized as the multiplication table is memorized. If a given set of facts were always and everywhere associated with a given definite type of city and no other, then the facts and the associated city types might well be drilled home on pure-practice principles. If a given type of mountain invariably made a certain type of climate, regardless of other influences, then mountains and climates might be taught as spelling is taught. No geographical intelligence would be needed. But none of these things is true; geography is not that

kind of subject. On the other hand, courses may be never so well laid out, the teacher's grasp on principles may be all that could be desired, the routine of administration may be impeccable—and yet unless there is present the daily application of pedagogical intelligence, monthly insistence on learning, and persistent training and discipline of pupils, the final outcome will be the same kind of pupil ignorance as of yore. Pedagogy is itself a science-type subject.

V

COURSES.—Colby calls geography “the science of regions.”³ A region is a geographical unity, that is to say, an area in which geographical factors and controls are common throughout the area. That means that geographers in attempting to organize an intelligible science fall back on the elements of intelligibility very much as we hunt for units in the science type. Further, a geographical region in its very nature is a science-type unit. Nevertheless, a geographical region, like a unit, is no fixed and determinate thing. The whole surface of the earth may be divided up into regions for purposes of study and research and for purposes of teaching as well. On the other hand, a single continent or smaller economic area can be studied in terms of a multitude of regions, just as a single secondary unit in history or in physics may be a full course in the University and beyond that a field of specialization. It is largely a question of the refinement required.

Again, at the professional level, students are concerned with systematic geography and its divisions into economic, political, and social geography. They are concerned also with regional geography and historical geography as studies in geographic methodology.

Finally, geography like other sciences has its scientific techniques such as climatology, cartography, topography.

Now in organizing courses in the secondary school, we are not at all concerned with professional aims and purposes nor with the

³ Charles C. Colby in *Commercial Education in the Secondary School*, Kitson ed., p. 199.

logical arrangement of a succession of courses. If we were concerned with logical arrangement, we should probably begin with cartography and spend nearly the whole school period in a study of geographic controls and factors such as topography, climate, soils, resources, governmental influences, and so on.

Nor are we concerned with preparation for university studies proper which only a small fraction of the pupils will ever pursue.

We are concerned with a course organization which is as well designed as we know how to make it to lead pupils into an intelligent elementary understanding of man's earthly habitat.

NOT MERELY FOR ELEMENTARY SCHOOL.—Geography has usually been looked upon as peculiarly an elementary school subject, while history is thought to belong to the high school. The reasoning is apparently a clear case of the ideational stereotypes which have become associated with our discontinuous schools. The essential program problem, on the contrary, is to work out a series of courses which define geography as a field in the whole program of general education. Since geography like history is educationally fundamental, we introduce the pupil to the field as soon as he has learned to read. Adaptation of teaching to the immaturity of these children is primarily a problem of classroom technique and not one of grade placement of courses.

GEOGRAPHIC VOCABULARY.—The ancient textbooks commonly began with a series of definitions to be memorized. "An island is a body of land entirely surrounded by water"—and so on at length with the other items of the vocabulary. Usable vocabularies are not learned that way; they are learned from context and experience. Here as in the constants of the sciences and mathematics and history, terms which require exact definition should be placed on the board and left as long as they are needed.

ELEMENTARY TECHNOLOGY.—The essential technology of the learner in geography is the use and reading of maps, not only political and topographical maps, but production, climatic, and weather maps as well. Kindred to maps are charts and graphic methods of representation. Now these, much like the vocabulary,

are in the nature of language and, like all language, they are learned best through constant use rather than in isolation.

THE PRINCIPAL GEOGRAPHIC CONTROLS.—Again, if it is felt that the principal geographic controls, topography, climate, location and access, soils, resources, must be studied separately, geography would be obliged to usurp nearly all the program space. For teaching purposes, controls appear rather as the warp upon which the fabric of insight and intelligence is woven throughout all the courses.

REGIONAL STUDY.—Altogether then the initial course is a survey of the earth's surface by regional types and this initial course includes in brief pretty much all the pupil will ever study. The organization by units which is at present in use in the Laboratory Schools is here given as an example.⁴

- I. How People Live in the Hot Almost Rainless Country along the Nile
- II. How the African Lives in Hot Wet Forests
- III. Life in the Mediterranean Lands
- IV. How People Live in a Mountainous Country—Switzerland
- V. Life on the Wet, Grassy Plains of Holland
- VI. How People Live in Norway, a Northern Mountainous Peninsula
- VII. Arctic and Antarctic Regions
- VIII. How and Where the Rest of the World's Population Lives
- IX. How Maps Show What People are Doing and the Kind of Country They Live In.
- X. Southern United States (How the people make a living in that section of the United States where the growing season is long, the moisture abundant, and land fertile. All of the units have an explanatory legend which characterizes the unit learning in terms of "How the people live." This particular legend appeals to the writer as one of the most apt and it is therefore quoted as an example).

⁴ The list was developed in the University Elementary School under the leadership of Miss Ruth Watson. For a series of texts organized and written with a similar purpose in view, see Barrows and Parker, *Journeys in Distant Lands, Southern Lands, United States and Canada, Europe and Asia*.

- XI. The North Central Section—the great food-producing section
- XII. Life in the Mountainous West
- XIII. How the Dense Population of Northeastern United States Is Supported by Manufacturing and Commerce
- XIV. Conservation: Using and Saving Our Natural Resources
- XV. North and South of the United States
- XVI. How Most of Great Britain's People Engage in Manufacturing and Commerce
- XVII. How People Are Living on the Great Plains of Europe
- XVIII. The Mountain Farmers, Shepherds, and Foresters of the European Highlands
- XIX. The Nomads and Oasis Farmers of the Thinly Settled Parts of Asia
- XX. The Farmers and Hand Manufacturers of Asia's Crowded Sections
- XXI. How Africa Has Hindered Exploration and Settlement
- XXII. How the White Man Lives in Africa
- XXIII. Australia and New Zealand: New Regions and Producers of Raw Materials and Foodstuffs
- XXIV. Tropical South America
- XXV. The Great Plains of South America
- XXVI. The Farmers, Shepherds, and Miners of Andean Countries
- XXVII. The Inter-relations of the United States and the Rest of the World

The foregoing course organization takes the pupils once around the world in a study of regions, always in terms of the major geographical controls. The course is certainly not perfect but it does represent experimentation based on defensible principles. It has been of relatively slow growth. It was originally laid out as a definition of a field in general education quite without regard to such queries as "How much can they do in one year?" At first the 27 units were not nearly complete in three years, but as time went on the ground covered was more and more. Now it normally represents about three years' teaching and study. Ideally a section of pupils should be organized as soon as pupils enough have assuredly learned to read in the fullest

sense. Some sections may finish before the end of the sixth grade, eighth year of our school life. Some may run over into the seventh grade. The length of time is not important: when they have learned, they have finished. In general, economical use of time depends upon the actual efficiency of teaching and of administration.⁵

THE EARTH AS A PLANET.—Now, in the regional study, the teacher has not hesitated to enlighten the pupils on any query which has arisen, despite the fact that there is no particular unit for that query. If a child is curious about the seasons, the matter is explained sufficiently for present purposes. If a fifth-grade boy has become interested in astronomy and raises some questions regarding *time*, the class is not warned off with the objection "You will have that later." Nevertheless, by the time the regional study is finished, various educational problems become pressing, either because the pupils have become curious or else because the development of geographical thinking makes certain new learnings essential. Hence, we shall turn to a new course which may perhaps be entitled *The Earth as a Planet*, and the unit organization which follows is suggested.

- I. The Solar System
- II. The Universe of Stars
- III. Day and Night
- IV. The Seasons
- V. The Zones
- VI. Locating Places on the Earth's Surface—Latitude and Longitude
- VII. Time
- VIII. Winds
- IX. Ocean Currents
- X. The Beginning and End of Mountains

Now some of these units may also appear in the course at elementary science at natural history level in the physical science field, and two considerations are to be noted.

⁵ See Part IV.

If this represents mere duplication, then of course the repetitious unit should be omitted from the general science course.

On the other hand, two units may bear much the same title and yet represent different essential attacks on much the same problem. For example, the unit Winds in this course in geography evidently has for its objective awareness of the great earth winds, such as trade winds and the prevailing westerlies, and intelligent attitude toward them as affected by the distribution of heat over the earth's surface, by the relations of land and water, and by the daily and annual motions of the earth. In elementary science, on the other hand, wind is likely to be an element in a unit which is concerned with the atmosphere or with weather.

INDUSTRIAL ACTIVITIES.—Finally, education as a process of higher adjustment implies a series of more specific intelligences addressed to man's utilization of the earth and to the conditions upon man's fundamental activities which the earth imposes. This is the field which sundry elective high school courses have cultivated under such names as industrial geography, economic geography, commercial geography, and the like. Since geography is fundamental to all the social sciences and since every individual must eventually think in terms of earth relations and controls if he thinks effectively and comprehensively in the field of the social studies, such enlightenment ought to be common to all. On the other hand, since the well-rounded program must contain courses in economics, politics, and sociology organized as such, the units in an industrial activities course should be limited to those which have a distinct and necessary geographical reference.

It would perhaps be hardly too much to claim that lack of the intelligences which such a course implies, not only among those who formulate and lead public opinion but more especially in the great mass of citizens who are otherwise intelligent and who in the last analysis make sound leadership possible or impossible, is one of the prime foundations of civic cleavage in the lines of the agrarian question and even of international selfishness and stu-

pidity. After all, in the last analysis, the planet is the patrimony of mankind and not of a single race or interest.

One thus has considerable confidence in claiming for such a course a large portion of program space. The course in its unit organization is suggested below:

I. *How people live out of the earth as well as on the earth*

1. Man's material needs are food, clothing, shelter, and comfort
2. For all these he depends ultimately on what the earth can give him
3. People are dependent in the first place on what the land can grow and on what they can get out of the earth and on the natural forces of the region
4. They are dependent in the second place on the accessibility of their home region
5. They are dependent in the third place on what kind of people they are, that is, on their education
6. In order to get their goods, people
 - (a) Cultivate the soil
 - (b) Manufacture
 - (c) Transport and communicate
 - (d) Exchange what they have and do not need for what other people have and do not need
7. What people do almost always determines the kinds and locations of the communities they live in

A. *Resources*

- II. Soils
- III. Fertilizers
- IV. Minerals
- V. Fuel
- VI. Power
- VII. The forest
- VIII. Animals

B. *Industry*

- IX. Agriculture
- X. Food products
- XI. Forest products

XII. Clothing and textiles

XIII. Metal and industries

C. *Transportation and exchange*

XIV. Transportation

XV. Waterways

XVI. Trade routes

XVII. Accessibility

XVIII. Exchange

D. *Communities*

XIX. Trading center

XX. Industrial city

XXI. Port

XXII. Entrepôt

XXIII. Seat of government

E. *Utilization of regional and earth resources*

XXIV. Improvement in agriculture and allied processes

XXV. Industrialization

XXVI. Emigration

XXVII. Trade

XXVIII. Conservation

A NEW KIND OF COURSE.—The course as thus organized is perhaps the most extensive we are likely to find in the field of general education. Its placement in the program is dictated by the two courses which precede and it will therefore ordinarily come relatively late, beginning normally at about the eighth or ninth grade level as grades now are. In a course which is as extensive as this is and to which the pupils are in the nature of things introduced when they are intellectually relatively mature, an extended application of the unit-learning principle becomes not only possible but essential, bearing in mind that the greater part of method is organization.

It will be noted that the course is preceded, not followed, by a summary unit, in which the pupil has a pre-view of the course very much as the Presentation in teaching technique constitutes the pre-view of a particular unit. Conceivably Unit I might be

converted into a course and its seven elements developed as units. The body of the course then falls into five major units and each of the minor or main constituent units is then an element of one or another of the major units. Nevertheless, each of the 27 minor units is subject to element organization and to that point we shall presently turn. Hence the course as a whole is a consistent piece of argumentation in which the thesis is stated in Unit I and the development of the thesis is undertaken in Units II-XXVIII.

VI

UNITS.—Now, beginning with the regional course, it would be very easy to develop most of these units as if they were descriptive accounts. It would be hard to do so in the units of the second course, since each of them in its nature has an understanding for its objective. If systematic procedure is applied,⁶ even a descriptive account is better than lesson-learning; but no educational products in the form of behavior patterns will result save by chance. So far as possible, the units are given titles which imply understanding rather than mere description, but a unit title does not guarantee the correct treatment of unit as unit. Hence we turn to element organization.

ELEMENT ORGANIZATION OF UNITS.—Teachers in the University Elementary School have worked out element organizations of which the following are typical.

- I. How people live in the hot, almost rainless, country along the Nile
 1. Because of the nature of the country, the Egyptians do the following:
 - (a) Build flat-roofed houses of sun-dried mud brick
 - (b) Frequently use roofs for out-of-door rooms
 - (c) Need no chimneys
 - (d) Have few outside windows
 - (e) Spend little time within their houses
 - (f) Wear long loose robes and turbans
 - (g) Wear sandals or go barefooted

⁶ See page 81.

- (h) Get water supply from the Nile or the occasional well
- (i) Have few domestic animals
- 2. Millions of people can live in Egypt because:
 - (a) The Nile floods have deposited fertile soil in strips of varying length along both banks of the river
 - (b) They can irrigate with water from the Nile or from wells
 - (c) They can cultivate several crops a year
 - (d) They need little clothing or shelter
- 3. Because the Nile has shallow shifting channels and its banks are high:
 - (a) Boats are built with flat bottoms
 - (b) High sails are used

The foregoing constitutes a fragment of what is almost a course outline.

VIII. How and where the rest of the world's population lives

Now the title of this unit makes it look like the product of one of those despairing moments when teachers of all science subjects, and regional geographers as well, find that they have much left over and so lump it all together and call it a "miscellaneous unit" perhaps. But when we note the elements of this unit, it is easy to see that the teachers despite their title had a unit in mind.

- 1. The people of the world live on great masses of land called continents
- 2. Each of the continents has mountains, plains, rivers, and lakes
- 3. About these continents are five great oceans
- 4. People living in similar regions the same distance from the equator are likely to be making their living in a similar manner
- 5. The way man makes a living depends to a great extent on the length of the summer or growing season
 - (a) Between the tropics of Cancer and Capricorn the sun shines directly at some time of the year and there is likely to be continuous summer
 - (b) Within the Arctic and Antarctic circles is continuous winter weather

- (c) Between the circles and the tropics, winter, summer, spring, and autumn occur
 - (d) The farther one moves away from the tropics, the longer is the winter and the shorter the summer
6. The seasons are opposite on opposite sides of the equator

In a similar manner the units should be organized in the course entitled *The Earth as a Planet*, in each case the few essential understandings from which the unit learning emerges being found and listed.

INDUSTRIAL ACTIVITIES.—For the first unit in the *Industrial Activities* course the elements have been exhibited. It is perhaps worth while to study a few other units, not merely for the sake of illustrating element organization but also to better define the character of the content of the unit itself.

V. Fuel

- 1. Man requires heat for cooking, for bodily warmth, for power
- 2. Available fuel resources therefore go far to determine whether:
 - (a) Man can occupy a region at all
 - (b) Can maintain industry
- 3. Fuel occurs chiefly as wood, coal, natural gas, oil
- 4. Surplus fuel can be exported like any other commodity

XI. Forest products

Note that The Forest has been studied as a factor in resources. The title of the new unit can easily mislead the teacher into merely cataloguing the products of the forest and exhibiting a moving picture of a gang of lumber jacks at work, in other words, mistaking possibly valuable assimilative material for the unit and its elements. On the contrary, the educational problem is to develop an intelligence touching the place of forest products in man's utilization of the earth and of the manufacturing activities which result. The element organization would then look something like this:

- 1. For the utilization of forest products, man is dependent on lumbering, gathering gums and similar substances, and manufacturing

2. Most forest products are not available for human use until they are manufactured
3. The forest industry depends on accessibility even more than most
4. Manufacturing is seldom conditioned by availability of power, since:
 - (a) Its waste products are apt to be fuel
 - (b) Or else its place relations involve water power
5. Lumber products especially are heavy and not easily handled; hence:
 - (a) The mill needs to be near the market
 - (b) Regions which are remote from lumber supply must usually do without or else pay high prices

XIV. Transportation

1. Effects
 - (a) Prevents famine
 - (b) Levels up regional inequalities
 - (c) Makes new country available
 - (d) Determines location of many cities
2. Means
 - (a) Draft and pack animals
 - (b) Ships
 - (c) Railways
 - (d) Automobile
 - (e) Air carriers

XX. Industrial city

1. Where power is cheap
2. Where raw material and manufacturing resources meet
3. Where a market is accessible
4. Where trade routes converge

XXVIII. Conservation

1. Resources are for the most part limited
 - (a) Soil is destroyed or becomes worn out
 - (b) Forest is used up
 - (c) Mineral and fuel supply is exhausted
2. Sometimes temporary substitutes can be found
3. Some regions have used all their resources

4. Posterity has as much right to live as we have
5. Most resources can be made inexhaustible through intelligent and unselfish use
6. Others can be made to last a long time by using only what is necessary

Now any of these courses in geography is no doubt capable of better formulation, but some series of courses can be found, if not these, which define the geographical learnings of general education. Better units can be found, but these are units. A better element argumentation for each of the units can be worked out, but the foregoing is an example of what unit organization for teaching purposes means.

CHAPTER XIII

COURSES AND UNITS IN MATHEMATICS AND GRAMMAR

DISCUSSION of the teaching of mathematics and grammar together in the same chapter is itself a good illustration of a teaching unit in the science type. Logically, the two should be discussed in separate chapters. As a matter of understanding the teaching process, the two belong together for the reason that the principles which govern the selection of the units in one are those which apply to the other. The reader will be able to gather a surer notion of the principles to be applied if he can see the two as essentially the same and can at the same time see them as qualifications of the principles which govern the selection of units in the physical and social sciences and in history. Mathematics and grammar, as commonly taught, seem to differ from the other sciences in the severely logical nature of the sequence of the units. To be sure, sequence is as valid and critical a matter in chemistry or in economics as in mathematics. It is futile, for instance, for the pupil to attempt the mastery of the unit "oxidation" if he has no notion of the nature of chemical changes. Nevertheless, the learning process in the physical and social sciences admits of wide variations in the order of the units, while in mathematics and grammar each unit is built on the preceding in a much more restricted fashion.

I

THE UNIT.—The critical test of the unit is the same as in the other subjects named; it must be a comprehensive and significant aspect of the science. It must further be understandable as distinguished from being merely capable of being memorized, and it must be capable of being tested for mastery.

The unit must be comprehensive. For example, in English grammar we find that pupils in about the fifth or sixth grade can learn the major elements of the simple sentence—the simple subject, simple predicate, direct object, indirect object, predicate noun, and predicate adjective—much more readily and much more surely if they are learned together when the unit is a comprehension of the simple sentence without modifiers than when the elements are learned separately and in isolation. In the latter case, the tendency seems to be to make the parts mere content in memory, and the pupil soon begins to stumble because, as he puts it, he “cannot remember which is which.” Similarly, processes like addition and subtraction in arithmetic can more effectively be taught together under the direct-teaching procedure than taught separately, or at least they can best be taught when the two units are later united in a complex “addition or subtraction.” The essential point is that the objective which can be mastered is an attitude in terms of an ideational complex which sweeps the whole unit, whatever the unit may be found objectively and experimentally to be. If the unit is found and mastered, the product is an understanding; if it is not found, the product tends to be mere content in memory of the lesson-learning type. In the latter case, the pupil exhibits his non-mastery by inquiring, “Do you add or subtract?” There further tends to be set up a singular inhibition, when processes are learned separately which belong together in the same unit, in that the pupil tends to magnify the difficulty of the later separate processes.

In experimenting with this issue, addition and subtraction were first tried as separate and successive units. At the end of a prolonged period of teaching, it was found that pupils would still guess which process it was with which they were dealing. The addition learning would still carry over into subtraction and confuse the issue. The learning unit is not merely addition and subtraction, one after the other, but the discrimination between the two as well.

The similar situation in multiplication and division is met by

the insertion of what may be called a generalizing unit, in this case that which bears the caption, "Variation." Taught separately without such a generalizing unit, the pupil tends to learn the processes as mere mechanical manipulation but not to learn the arithmetical essential which may be described as a discriminating sense of application in a thought process. All the way up into the high school and beyond he inquires, either explicitly in words or implicitly by guessing, "Do you multiply or divide?" Hence the essential pedagogical unit of multiplication and division is in the new unit which we have inserted after the two manipulation units. That unit is taught until the new understanding is established, until the class as a whole sees the relation clearly and is in no more need of hesitating over the application than are we adults who are never in a shadow of doubt whether "you multiply or divide."

In the detailed study of problem cases, this curiosity sometimes turns up. The pupil notes the layout of numbers. If there are several, he adds. If there are only two of approximately the same order, he subtracts. One large number and one much smaller means multiply or divide as the dice fall. Life is a gamble after all, or at least so he apparently thinks.

The same principle can be seen in grammar in connection with the very thin units, gender, number, person, case, and tense. It is a simple matter to teach each of them and to apply the rules of agreement to each. Indeed, this part of the teaching process is so simple that it is entirely possible not to teach them at all but rather to hold the pupil responsible for learning them without teaching. The result is all too familiar. There is a memory content which is perfectly good in a specific memory test but which does not "transfer" to usage. Failure of transfer means failure to learn some critical unit. If now we introduce a generalizing unit, call it "agreement," and teach this unit to the point of mastery, we shall have established the critical and essential learning product. Otherwise, such real learning as may result is accidental.

EDUCATIONAL UTILITY.—The unit must be significant. That is to say, it must bear an important relationship, if not to the pupil's current experience, at least to the use of mathematics and grammar in the field of general education. In the modern period, the learnings in mathematics have been very largely cut down and of course some competent authority doubts the utility of grammar altogether. Further pruning, especially in the mathematics field, would probably be advantageous.

If we except geometry conceived primarily as a study of space relationships, the educational import of mathematics is that it is a means of access to learnings which are otherwise inaccessible, or at least not readily accessible, and a convenient means of expressing learnings. The pupil states the principle when he says, "You can solve that problem by algebra but not by arithmetic." If now the reader will canvass the mathematics which is needed in various courses in physics, chemistry, economics, shop, and all other subject matter, up to the end of the junior-college period, including what mathematics would be used in learning and teaching if it were available, he will be surprised at the small range of learning required. The only utility of much of the mathematics taught in the secondary school is in the study of more mathematics or else in the pursuit of some other specific professional end.

Similarly, the educational utility of grammar is purely that of an instrument with which the pupil can criticize his own discourse. Having mastered the essentials of sentence structure and the implications thereof, the pupil has come into possession of a method of thinking which enables him to reflect upon the expression of his own thought. With this principle in mind, the teacher can readily identify the significant aspects of grammar by applying to each proposal the test, Does it contribute essentially to one's ability to think his way through the structure of his own discourse?

WHAT A UNIT IS NOT.—Much the same errors are made in the determination of units in mathematics and grammar as in other courses which belong to the science-type field. Neverthe-

less, such errors are less common and perhaps more inexcusable here than elsewhere for the reason that both subjects have always tended to consist in obvious units. The confusion between understanding and descriptive material is hardly possible.

The most common error is failure to distinguish between a unit objective and a chapter. *Addition* or *division* can hardly be otherwise than a unit, although the unit may be badly organized as a matter of element analysis and its assimilative material may be badly chosen. *Fractions*, however, or *factoring* is almost certain to be treated as a chapter heading unless the classroom teacher is very clear in his conception of the nature of the objective. Each of them tends to become a mere classifying term for a list of more or less related minor objectives.

On the other hand, either the persistence of the chapter-classification stereotype or else failure to distinguish between units in an illusory shortening of the course, sometimes results in a unit title in which there are in reality two or more units. An example of this is found in a unit for solid geometry entitled "Volumes and polyhedral angles." Here are at least two units and the element analysis shows that the word "volumes" is in reality a title heading for a chapter of four topics. If the unit had been entitled "Solids" and the deliberate purpose had then been to reach an understanding of the nature of a solid in space, a true unit would have been the result. The elements would have then been:

1. The common solids
2. Polyhedral angles
3. Spherical angles
4. Spherical triangles
5. Spherical polygons

A true unit entitled "Surfaces in space" had preceded in the course in question.

It sometimes happens that an organizer is ambitious to include a whole course in a single unit. In this case of the unit "Solids," for instance, such a teacher might easily find himself forgetting that solid geometry as a whole deals with tri-dimensional space.

II

THE UNIT ELEMENTS IN MATHEMATICS.—As elsewhere in science-type subjects, each unit tends to consist in several critical learnings and in general there is no guaranty of mastery unless all are found. The tendency is to take it for granted that the pupil will take on some of these learnings of his own accord. Some will do so in some units. It must be remembered that the mathematics which we teach is not only a late acquisition of the race but it is highly abstract. Let us take the unit *addition* in arithmetic as an example.

As in the cases of most other units, there is a broad division between the appropriate manipulation processes and the recognition of addition situations, that is to say "Knowing when to add." An analysis of manipulation will disclose the essential learnings to be: one-column addition, carrying, addition in two columns, more than two columns, mixed columns such as,

$$\begin{array}{r} 3025 \\ 15 \\ 346 \\ 8 \\ \hline \end{array}$$

The unit set up for teaching will then look like this:

*Addition*¹

A.

1. One-column
2. Carrying
3. Two-columns
4. More than two columns
5. Mixed columns

B. Addition situations

Be it noted that accuracy and rapid calculation are not elements of the learning unit but rather skills to be developed through practice and drill.²

¹ See also *guide sheet*, page 306.

² See page 574.

Again, let us take the unit *The Equation* in algebra, and let us bear in mind the unit quality of the learning product. We are not concerned with all kinds of equations. If we were, we should have a chapter and not a unit. We are not concerned with possible applications of the equation. We shall need a great many in the guide sheet, but not here. We are not concerned with ideational content to which the equation can be applied but which is at present far beyond the experience of the pupils. We are not concerned with an expression in the form of an equation in which the sign of equality is a mere substitute for some form of the verb "to be." We are concerned with the nature of the equation as an instrument in mathematical thinking and with the fundamental manipulations. Thus we readily arrive at an acceptable element organization.

The Equation

1. A balance between quantities—if there is no balance there is no equation.
2. What is added to or subtracted from one side must be added to or subtracted from the other side.
3. One side can be multiplied or divided if the other side is multiplied or divided by the same number.
4. We can transfer from one side of the equation to the other if we change the signs.

And so with other units. In each case the elements can be found roughly and tentatively through a priori analysis. Steadily improving analyses are however a matter of close observation of the learning process in the classroom, and especially of problem-case study, of inferences drawn from scientific analyses of the learning process in arithmetic, and, beyond all else, of sound pedagogical judgment based on all the foregoing.

More elements are likely to be found in some units than will be found in units in other parts of the science-type field, since the learning process is more critical. But here, as there, a long list of elements always raises a suspicion that the analysis has become pedantic and that discrimination between what is essen-

tial and what is non-essential is poor. Some of the units may contain not more than two or three elements and some no elements at all. In the latter case, the unit is elementary.

III

TYPICAL COURSES IN UNIT FORM.—The course in arithmetic suggested below is substantially as it has been worked out to date in the University Elementary School. In certain cases the element organization is given as further illustration of the principle of finding the critical elements which lead up to the unit understanding—unit ability in Unit I. As in the case of the courses discussed in chapters xi and xii, this course in arithmetic is an attempt to define arithmetic in the field of general education. It has no grade placement: There are sometimes pupils enough who are ready toward the end of the third year to form a section. Conceivably, other sections in a large city elementary school might not be ready for another year and an occasional section a year earlier. By the middle of the sixth year some sections are completing the course, while there is usually a slow section left which continues over into the seventh year.

ARITHMETIC

I. The reading and writing of numbers

1. Reading numbers
2. Writing numbers from dictation
3. Writing numbers in figures from numbers written in words
4. Writing numbers in words from numbers written in figures
5. Reading Roman numerals through 2000
6. Writing Roman numbers from 1 to 100 and from 1000 to 1929 (or to date)

Mastery consists in ability to react readily to all the operations listed, as ultimately tested by the pupils' ability in the uses required by the school. It does not imply never making a mistake; none of us arrives at that level; it does imply not customarily making mistakes.

II. Addition

III. Subtraction

1. Taking one number from another to find the remainder
2. Taking one number from another to find out how much larger or smaller one number is than another
3. To find out how much has to be added to one number to make another

IV. Addition and subtraction contrasted

The learning product here is not addition or subtraction but discrimination between the two in problem situations.

V. Multiplication

VI. Division

VII. Variation

1. Discrimination between multiplication and division situations
2. The direct-ratio relationship
3. The unit-analysis situation

VIII. Measurement

1. The meaning and purpose of measurement
2. Experience with common measures

IX. Denominate numbers

The fundamental operations with all commonly used denominate numbers

X. Fractions

1. Fractional parts of one whole thing
2. Fractional parts of a group of things
3. The fraction as a ratio
4. Fractions in lowest terms
5. Equivalent fractions

Not a chapter. The learning product is an understanding of the nature of written fractions as used in mathematical processes—not the primary concepts of fractional parts. Element 4 is serviceable not because of its value in manipulation but because of its contribution to the unit understanding.

XI. Fractions which are in form greater than unity

XII. Common denominator

XIII. Addition and subtraction of fractions

XIV. Multiplication and division of fractions

XV. The decimal fraction

Learning product is an understanding of the decimal fraction.
Cf. X.

- XVI. Conversion of common fractions into decimals and vice versa
- XVII. Addition and subtraction of decimals
- XVIII. Multiplication and division of decimals
The major portion of the body of concepts which function in the corresponding processes in integers are available here. The critical points are manipulation of the decimal point and contrasts between the processes
- XIX. The percentage relation completed
Inherent in preceding units
- XX. The notion of factors

OMISSIONS.—It will be observed that this organization makes no provision for various items usually found in courses in arithmetic. There are omitted, in the first place, the primary adaptations, that is to say, the elementary number concepts upon which the possibility of study depends. These include especially the following:

- a*) The concept of number itself, which most children properly develop within the kindergarten period
- b*) Figures as symbols for expressing number
- c*) Combinations of numbers into other numbers
- d*) Fractional parts
- e*) The concepts of multiplication and division of numbers
- f*) The concepts involved in the common measurements
- g*) The primary spatial concepts
- h*) The number space (addition-and-subtraction combinations) and the multiplication table
- i*) The conventions for expressing United States money

Note, however, that, while *h*) may be taught in the primary school it is no part of the primary adaptations proper, but is an illustration of automatic habitual-response development under the pure practice type of teaching. It is essential to the study process and may need to be perfected within the secondary period. See chapter xxvi.

CRITICAL IMPORTANCE OF PRIMARY ADAPTATIONS.—Discussion of the technique of teaching as applied to the primary learnings in number belongs to a volume devoted to primary teaching. Their fundamental importance to the whole problem of mathematical thinking is however so critical that something more than passing notice of their relation to unitary organization of the course in arithmetic is called for. Clear notions of their influence on the later learning process are of practical service, especially in connection with the treatment of problem cases whether the latter be corrective or remedial in character. It is commonly taken for granted that bright children passing through the primary school are sufficiently well grounded in this respect. Ingenious testing focused upon the primary adaptations often shows the contrary to be the case, shows that such children's ordinary responses are mere verbal memory content rather than evidences of the essential concepts. Noteworthy shortages are illustrated by the following instances.

The child has acquired a sort of perverse facility in manipulating figures without a realization of the quantities for which the figures stand or of the meaning of the processes or combinations which he employs. Among other later symptoms of inhibited learning power is often a tendency to report results of calculations which are on the face of things absurd. The pupil does not sense the absurdity because he senses nothing about the situation beyond manipulation of figures.

The common measurements turn out to be mere memory content. A quart is a measure and it is made up of two pints; somebody told him so. But the measure stands for no concrete quantity in his mind. He can box the clock dial, as the mariner boxes the compass, but told to be in a certain place at ten minutes after twelve, he asks his room teacher if it is time to go.

Many of the shortages occur simply because the teacher has not diligently checked up the learning units by individual appropriate testing. The median of the class is equal to or above the norm of class performance for that grade. The teacher does

not stop to inquire whether she is using a performance test or an individual adaptation test, nor is she concerned about the non-learning individuals so long as the group is up to standard. In brief, failure of the pupil to make the primary adaptations means failure to learn to use mathematics as an implement of thinking.

The development of the primary adaptations calls for direct teaching, testing, and reteaching, but no element of study, properly so called, is present.

OTHER OMISSIONS.—Second, there is omitted from the course organization in arithmetic, as outlined above, the development of appropriate facility in the use of the arithmetical processes, such, for instance, as rapid and correct column addition. This, like the development of facility in the number space and multiplication table, requires teaching under the practice principles and the technique is quite different from that which is applicable to the units of understanding which we have listed. When such facility becomes desirable, a separate course or daily drill period should be set up and the appropriate objective systematically sought (see chap. xxvi).

In the third place, there is omitted the learnable but non-teachable material in which automatic response is unnecessary. There is included here, especially, factual material such as the tables of denominate numbers. Some few facts should ultimately be made items of automatic response, such, for instance, as the number of inches in a foot, the number of ounces in a pound, etc., but for the most part such bodies of arithmetical constants should be made conveniently available to the pupil and he should be made responsible for looking up his material when he needs it without the intervention of the teacher. In the lower levels of the secondary school, it will be convenient to hang in the room the appropriate charts. Later, the books provided should contain tables of constants. In due time, the pupil will tend to select for himself the constants for which he needs automatic response. If he does not do so, he must be drilled. Here, as elsewhere, eternal vigilance directed to the learning, or rather lack of learning,

of individual pupils is the price of good teaching and the effective school. Nevertheless, it is wasteful folly to drill pupils on the retention in mind of constants which none but the professional requires or to drill all pupils on the retention of constants which everybody requires when most pupils have acquired them without drilling.

ALGEBRA

Here again we trench on the domain of curriculum-building to the extent of suggesting the unit organization of a course which defines algebra in the field of general education, and which attempts to avoid: (1) algebraic learnings the only purpose of which is the learning of more mathematics; and (2) those which are primarily contributions to professional learning. The universities and the professional schools ought themselves to become responsible for these. Nevertheless, algebra is distinctly one of the fundamental methods of thinking which civilized man employs. As such, elementary algebra is a coherent whole and many of the learnings are essential to algebraic doctrine quite apart from their particular utility. Viewed strictly as curriculum content, I think I err on the side of including too much rather than through excluding too much.

The following unitary organization of a course in elementary algebra is then suggested as illustrative of the principles set forth:

- I. The concept of literal numbers
- II. The concept of plus-and-minus quantity
- III. Graphic representation
- IV. The simple formula as an algebraic expression
- V. The equation
(The concept of the equation and the solution of the simple linear equation but not extended processes of solution)
- VI. Addition and subtraction
- VII. Multiplication
- VIII. Expansion of binomial and trinomial expressions
- IX. Division

- X. The concept of factors in algebra
- XI. The factoring process as applied to the following type forms:
(The appropriate assimilative material in factoring is found in fractions and quadratics. Hence mastery is apt not to occur until later.)
 - a) $x^2 \pm 2xy + y^2$
 - b) $x^2 - y^2$
 - c) $ax^2 \pm bx + c$
 - d) $x^{3n} \pm b^{3n}$
- XII. The algebraic fraction as a ratio
- XIII. Lowest terms
- XIV. Fractions greater than unity and mixed numbers
- XV. The common denominator
- XVI. Addition and subtraction of fractions
- XVII. Multiplication and division
- XVIII. The linear equation with one unknown
- XIX. The linear equation with two or more unknowns
- XX. Exponents
 - Elementary theory of exponents in both integral and fractional forms and operations with exponents
- XXI. The quadratic equation
 - Elementary theory of the quadratic and solution of simple forms, but not extended application
- XXII. Square root
 - Meaning of square root and the arithmetical process

As in the case of arithmetic, and indeed of all the science-type subjects, items which are learnable but do not require teaching are omitted. Two illustrations will suffice.

In the first place, the algebraic vocabulary is not included. For instance, there may be placed on the board the following: "A monomial is an expression of one term: a^2b^2 is a monomial." "A binomial is an expression of two terms: $(x+y)$, x^2+xy , $(abc-def)$ are binomials." Similarly, exponents and coefficients as items in the vocabulary. The theory of exponents, however, is a teaching unit in the course. The legends are then allowed to stand and teacher and pupils drop naturally into the appropriate use.

A special consideration arises in the case of factoring. In the first place, an understanding of the nature of factors must be established. Too often the pupil fails at this point; he learns the manipulation and perhaps acquires considerable ability in factoring expressions which are set down in plain terms. But failing to understand the nature of factors, he is quite as apt to pick out expressions which are not factors as those which are. For instance, he becomes expert in manipulating expressions in the form $x^2 \pm 2xy + y^2$, but confronted with an expression in the form

$$\frac{x^2 - y^2 + 2(a^2 + b^2 + c^2)}{x + y + a^2 + b^2 + c^2}$$

he is likely to treat $x + y$ and the expression $a^2 + b^2 + c^2$ as if they were factors of the terms of the fraction. He does not understand the nature of factors. The objective implied by Unit X is this requisite learning product.

On the other hand, the manipulation of the type forms listed above, and of others which the teacher may think desirable, involves an element of memory. For instance, there is nothing in the understanding of the nature of factors which gives us the divisors in forms like c) and d) on the list. That has to be remembered. For this purpose, it is well to have on the walls of the room charts in which these type forms are set up in factored form. If, however, the pupil is preparing for special study in some mathematical field, the manipulation itself should be drilled until it becomes automatic. This calls for appropriate drill procedure under practice principles.

IN CORRELATED MATHEMATICS.—Unitary organization in correlated mathematics is illustrated by the two courses presented below. The organization thus set up has been in use in the University High School.

MATHEMATICS I (GRADE VII UNIVERSITY HIGH SCHOOL)

- I. The conception of line segments
- II. Formula representation of numerical facts

- III. The angle
- IV. Indirect measurement
- V. The circle
- VI. Formulas and equations
- VII. Areas of rectangles and squares. Multiplication of polynomials.
Square root
- VIII. Areas, of quadrilaterals, triangles, and circles

MATHEMATICS II (GRADE VIII UNIVERSITY HIGH SCHOOL)

- I. Areas of surfaces and volumes of solids with algebraic implications
- II. The conception of positive and negative numbers
- III. Solution of problems involving signed numbers
- IV. The quadratic equation
- V. Functions of one variable
- VI. Linear equations in one and two unknowns
- VII. The quadratic equation (second unit)
- VIII. Factoring and fractions
- IX. Exponents and radicals

It will be noted that geometry can be taught under the science type, provided it is conceived as an inductive science in which the objective is primarily and solely the establishment in the pupil of an understanding of the nature of the various space relations. If, on the other hand, the objective is primarily training in the application of deductive reasoning to the study of space relations, the learning product, as we have seen, is in the form of a specific power and the technique which is applicable is a form of practice. Viewed as the establishment of a series of understandings of the phenomena of space relations, Units III and V in Mathematics I above are appropriate illustrations. The teaching technique is in all respects the same as that which is applicable to a unit in physics, chemistry, or biology. The unit dealing with the circle, for instance, is developed in precisely the same manner as the chemistry unit which deals with oxidation. Whether inductive or deductive teaching is the appropriate means of accomplishing the desirable educational adjustment is a problem of

method with which this work has nothing to do. It is essentially important, however, to keep the two teaching objectives distinct in mind and not to attempt to apply the same technique to both methods. There is appended a unitary analysis which seems to be appropriate to the treatment of plane geometry as a science-type subject.

PLANE GEOMETRY TREATED AS A SCIENCE-TYPE SUBJECT

- I. The angle
Conception of the angle; measurement; the right angle; sum about a point; complementary and supplementary angles
- II. Parallel lines
- III. Perpendicular lines
- IV. The triangle as a plane figure
Sum of angles; types of triangle; the exterior angle relations; properties of right, isosceles, and equilateral triangles; congruence; similarity; relation of angles and sides
- V. Quadrilaterals
- VI. The polygon
- VII. The circle as a plane figure
Angular values; angles and arcs; tangency; chords and arcs; inscribed angles; angle relations of chords, tangents, and secants; relation of circle to inscribed and circumscribed triangle, square, and polygon
- VIII. Areas
- IX. Loci
- X. Proportion as applied to plane figures
- XI. Symmetry

In Units I, IV, and VII, the outstanding properties are listed as suggestive of the appropriate elements. The test of the unit is its application to the interpretation of concrete situations, not the memory of the properties involved. The assimilative study should rest, so far as possible, upon geometrical construction and upon the solution of concrete problems, arithmetical and algebraic as well as geometrical, which can be focused upon an understanding of the unit. The reader is reminded that all such assimilative

problems should be devised for the purpose of developing the unit understanding intended and not for the purpose of training pupils in "problem-solving." See comments on assimilative material below. For purposes of geometrical construction the study-room should be fitted up with suitable drafting apparatus and with roomy blackboards. Careful and workman-like drawing should be insisted upon.

IV

ASSIMILATIVE MATERIAL IN MATHEMATICS.³—In the case of mathematics as in those of the subjects discussed in the two preceding chapters, a very critical consideration is the distinction to be made between the unit and its assimilative material, between the learning product itself and the experience out of which learning may arise. In daily-lesson procedure, the distinction is commonly overlooked and the pupil is constantly taught assimilative material until the objective itself is lost to view.

So far as general education is concerned, mathematics as we have seen is valuable chiefly as a means of interpreting those aspects of the world which are not otherwise capable of analysis. Similarly, the chief use of grammar is that of a piece of critical apparatus which the individual uses in justifying the clarity and logical coherence of his discourse. Hence, the best assimilative material in both mathematics and grammar is the application of the mathematical processes and grammatical principles to concrete material.

In each unit of mathematics, therefore, the assimilative material is properly concrete applications in the form of which are commonly called "problems," all of which are focused upon the elements of the unit in succession and upon the unit as a whole. Assimilative material is opportunity for the broadest and most varied experience-getting in the application of the unit studied. Every feature of the examples given for study, however, must itself be within the comprehension of the pupils, for otherwise it will not focus upon the unit. Examples of the type which fol-

³ See also *guide sheet*, page 306.

lows are, for example, appropriate assimilative material for addition and subtraction at third- or fourth-grade level.

"In Miss A's room are 41 children; in Miss B's, 39; in Miss C's, 26; in Miss D's, 45. How many are there in the four rooms? How many more has Miss A than Miss C?" The material is within the experience of the pupil and it focuses upon the unit.

The example might have been this:

"There are four pipes pouring oil into a tank. One pours in 181 gallons a minute; another, 156 gallons; a third, 175, and a fourth, 216. How many gallons do all pour in in one minute?" The elements may be within the experience of some children, but these are very few. Most children will get the cue that addition is called for, and the result is a mere drill exercise with numbers. The material does not focus upon the use of the unit as a means of interpreting actual environment. The pupil senses no reality. The docile take a step in the direction of lesson-learning. The direct learners are apt to balk.

Again an example like this (an actual case):

"Mr. H. sells his potatoes for \$1,275; his wheat for \$2,480; his hay for \$752. How much does he realize on his sales?" Again, many of the children got the addition cue, but, in a school in which the emphasis is upon direct learning, most of the children balked upon the expression "realize on his sales," which was not within their vocabulary. The performance of some of the children was satisfactory, but there was no more evidence of learning in their cases than in those of the children who balked.

In the higher mathematics of the secondary school, it is not always so easy to use concrete assimilative material. Geometry of course in its nature deals with such and trigonometry to a large extent. In algebra the situation is somewhat different. In the algebra units suggested above, the first unit encountered as we read down the list which cannot be so treated is VI. But here the unit has to do with the manipulation of certain algebraic expressions, and they become themselves the concrete material. The same thing is true of the other units in this course, save

that the application of the equation wherever we meet it is always to concrete situations.

WRONG EMPHASIS ON PROBLEMS.—The emphasis placed upon problem-solving in many mathematical texts sometimes tends to throw assimilative material completely out of focus. At bottom, the difficulty arises from confusion in the objectives. The proper objective, for instance, may be the application of the mathematical process known as the equation to the interpretation of certain concrete situations. The textbook-maker hopes to develop in conjunction therewith an abstract power which he calls "problem-solving ability." The two objectives cannot be developed in unison unless one is a function of the other, and this is not often the case. The solution of a puzzle focuses the learning power upon that unrelated objective and directs it away from the learning of the mathematical principle which is the proper objective. The pupil becomes more concerned in the solution of the puzzle than in learning the equation principle. The result is pedagogical confusion. The learning which results is uncertain and accidental because there is no single clear objective in the teacher's mind to which the mastery process can be applied. The situation is frequently aggravated, especially in the case of the equation, by the introduction of special types of problems which require the application of special methods of solution. These are prone to be either problems drawn from specialized fields, in which the pupil has had no experience, or else problems which are pure mental gymnastics unrelated to any probable environmental need. Clock problems, hare-and-hounds problems, fast-and-slow train problems, tank problems, and the like will occur to the reader as illustrations. The problems which are to be focused upon the unit should be such that their elements are within the experiences of the pupils concerned, such that the conditions involved are within the powers implied by the pupils' mental age, and so worded that the vocabulary employed is their usable vocabulary.

There seems to be a broad principle of learning and intellec-

tual development involved here upon which it is worth while to comment in passing. Problem-solving is essentially and fundamentally reflective thinking, and, conversely, reflective thinking is problem-solving. As we have seen, the conditioning factors under which thinking takes place are: (1) something to think about; (2) a method of thinking; (3) inherent capacity to think at all; and (4) a motive for thinking. Now, mathematics and linguistics are primarily methods of thinking. When we add to a pupil's repertoire of methods an adaptation implied by one of the units, the equation in mathematics for instance, we have put him in possession of an additional tool for use in his reflective processes. We have in that sense improved his capacity to think, but we have not modified his inherent mentality. His mental index remains the same as before. If he uses his new tool a great deal he acquires facility in the application of that particular tool to many kinds of situations which he meets, but it is facility which he acquires through practice and not a generalized gymnastic effect upon his inherent mentality. We do not expand his stock of things to think about; we give him a method of reflection upon his present stock and upon the additions to that stock which he may later acquire. We make possible an extension of his motives for thinking by giving him an additional tool, just as we expand his motives for carving, or mischief as the case may be, by giving him a knife.

If we think it worth while for him to learn a particularly puzzling type of problem, then in reality we have decided to give him an additional method of thinking. If it is worth while for him to learn how to solve clock problems, then we should add a unit on clock problems and teach it. The value of such a unit depends strictly upon its usefulness in attacking significant aspects of the environment and not upon its use as mental gymnastics. The process or principle taught in its application to actual experience is what is important to the development of thinking power and not its mechanical manipulation, on the one hand, nor its application to difficult and unusual problems, on the other.

V

THE UNIT IN GRAMMAR.—In developing the theory of the science-type unit as it is found in mathematics and grammar, we have thus far used mathematical illustrations almost entirely. No illustration and no argument drawn from the field of mathematics is without its application in the field of grammar.

The educational use of grammar is limited to those principles which put the student in an intelligent attitude toward the structure of his own discourse or toward the structure of discourse which he is likely to use. It does not imply the grammatical training of the specialist nor purely eruditional acquisitions which have little or no bearing upon accurate use, voice and mood for instance. Now the educational use of grammar has been singularly liable to attacks of eruditionalism. While such refined study is in many cases no doubt of the highest importance to the linguistic specialist who works in the ever-present hope that some refinement of analysis will lead to the shedding of new light on the nature and development of language and the evolution of human society, its products serve no useful purpose in helping the pupil of the secondary school to understand the structure of the discourse which he uses. The test of the value of a unit in the teaching of grammar is, therefore, Will it help the pupil to understand the structure of his discourse? The test is not, Does the pupil need to know?

The illustrative unitary organization given below is subject to all the qualifications which have been enumerated in this and in preceding chapters touching such organization.

SUGGESTED COURSE IN GRAMMAR

Unit

- I. What are the essential parts of a simple sentence?

The essential parts of a simple sentence are the subject, the verb, and the complement of the verb if it requires one.

- II. How simple sentences may be combined

Simple sentences may often be combined into compound and complex sentences in ways which make the relationship between them more clear.

- III. How words are classified into the parts of speech
All words are classified into eight parts of speech according to their use in sentences.
- IV. How verbs change their form to show tense
Verbs have different forms to indicate present, past, and future time, or tense.
- V. How verb phrases are formed and used
Principal verbs are combined with auxiliary verbs to express ideas of continuing action, completed action, passive voice, and many ideas of doubt and uncertainty.
- VI. How some parts of speech change their form to show number
Nouns, pronouns, verbs, and a few adjectives change their form to indicate singular or plural number.
- VII. How nouns and pronouns change their form to show gender
The personal pronouns and some nouns change their forms to indicate differences in sex.
- VIII. How pronouns change their forms to show person
The personal pronouns have different forms to indicate the speaker, the person spoken to, and the person or thing spoken of.
- IX. How the parts of a sentence agree
A verb agrees with its subject in number and person, and a pronoun with its antecedent in number, gender, and person. All parts of a sentence must be in logical agreement.
- X. How pronouns and nouns change their forms to show case
Pronouns and nouns have different forms for different constructions in the sentence.
- XI. How adjectives and adverbs change their form to show comparison
Adjectives and adverbs have three forms to show different degrees of a quality in the comparison of two or more than two things.
- XII. How a phrase or a clause may do the work of a modifier
A prepositional or verbal phrase or a subordinate clause may do the work of an adjective or an adverb.
- XIII. How a phrase or a clause may do the work of a noun
A phrase or a subordinate clause may take the place of a noun as the subject or the complement of a verb, the object of a preposition, etc.

The foregoing represents the course in grammar much as it was in the first edition but modified by the results of about five years of experimental teaching under the direction of Miss Edith E. Shepherd. It will be noted that Miss Shepherd has introduced a variant of the element organization by clearly restating in explanatory sentences the unit learning itself.

The assimilative material on each unit is: (*a*) analysis of sentences selected in such wise that they will focus on an understanding of the unit set up for teaching; (*b*) the interpretation of usage principles as they apply to the unit. For instance, in Unit IX, the appropriate assimilative material is a great variety of sentences in which the antecedents of pronouns, both relative and personal, are traced. Likewise, the correction of instances of bad usage in which the pronoun does not agree with its antecedent or the verb with its subject is set up in abundance. Assimilation is approaching completion when the pupil can reliably identify agreement in case after case and can also reliably detect and correct instances of bad usage.

CHAPTER XIV

EXPLORATION AND PRESENTATION

THE unit objectives being clearly in mind, we need next to seek and to analyze the teaching and study procedure under which the successive understandings can best be established.

Teaching in the science type is more determinate than is teaching in appreciation, that is to say, it is more easily possible to set up a definite goal and to attain that goal through a somewhat definite procedure and with the use of an intelligently selected body of material. On the other hand, the objectives of appreciation are for the most part very ancient in the history of civilized man and on the whole they are commonly present in the mores. Most people, for instance, know what honesty means and realize that they ought to practice it. Not so with the objectives of the science type. They are a recent product of cultural evolution. They are not patterns in those who possess them which are obvious to those who do not. While decency is more fundamental than intelligence, the fact remains that there are many more decent people in the world than intelligent people. The learning process in the science type requires the exercise of an adaptive power in man in respect to which he is on the whole probably farthest from the brutes, namely reflective thinking. The learning product itself is elusive and other types of reaction are easily mistaken for it.

Altogether then the classroom technique requires an elaborate procedure in which there is maximum provision for keeping constantly before the teacher's attention the necessity for following the minds of the pupils and for constraining the pupils in an indubitable pathway of reflection.

We may then proceed to the setting up of a systematic procedure which is applicable to each unit in a science-type subject.

For this purpose, the steps which we discuss in detail in the present chapter and the two which follow have been found convenient. But be it noted: (1) that this five-step procedure is not an application of the Herbartian five steps; and (2) that it has application to the science type alone, save as a modification is applied in practical arts.

In general then, in attacking a new unit a class appears in the classroom without previous assignment and devotes it may be several weeks to the thorough study and assimilation of the material. For this purpose, the classroom ought to be so far as possible the study room of the pupils. When the daily period is ended, the doors should be shut on that subject until tomorrow, except as voluntary projects or intellectual interests dictate further reading and study and except as circumstances such as absence require additional study on the part of some pupils.

EXPLORATION

EXPLORATION can perhaps be conceived as having three principal purposes: economy, the establishment of apperceptive sequence, and orientation.

I

One of the author's students reports a case in a social science class in which the exploration revealed the fact that a pupil had studied the Industrial Revolution no less than five times. Imagine the destruction of any normal budding of interest in compelling that pupil to pursue the subject for the sixth time in a class which was otherwise very vaguely aware of the meaning of the term!

Another reports the case of a pupil in algebra who attained a perfect score on the pre-test of the unit "Factoring." He had not attained a passing grade on algebra as a whole in the previous course and so was repeating. Nevertheless, if compelled to go through the lesson-learning experience on that unit once more, one or all of several things would happen. There would be the

needless load of one pupil in an already overlarge class. The pupil would be likely to acquire an inclination to dawdle in the boredom of threshing over old straw. More important than all else, he would be likely to acquire a pronounced and perhaps permanent resentment at what to him was the incomprehensible injustice and folly of the school.

There are likely to be found in every class, if the teacher will carefully and critically look for them, pupils who work "in advance of the class." Such are probably instances of nascent self-dependence in learning power. They have not arrived at the full self-dependence implied by the termination of the secondary period, because they have not acquired the full intellectual background and social maturity which makes it possible for them reliably to seek and to work at their own problems. Skilful exploration makes it possible to identify and to encourage such pupils and, what is more important, to furnish the class as a whole with concrete illustrations of what education really means. Furthermore, when such pupils are allowed, with the approval of the teacher, to expand their programs of study by means of extra projects, definite progress is being made in their cases in the direction of sound and full intellectual maturity. Finally, we are thus furnished with a means of identifying and selecting the potential scholars and scientists and intellectual leaders of the next generation which is infinitely more reliable than any possible test of native brilliancy.

If the course is organized in units, such pupils as those whom we have used in illustration can be excused for a whole unit. If they are believed to be responsible in the use of free time they can be released from class altogether. Otherwise, they can be allowed to bring other work to the classroom for the time being. The effect on repeaters may well be very happy indeed, for the encouragement which comes from recognition of genuine success in having learned is well calculated to generate an entirely new volitional attitude toward school and toward learning. In some cases, skilful recognition of the true educational situation may

well result in a new learning activity which will restore the lost class standing.

As the unitary organization of the course becomes more effective with the lapse of time, and as the procedure in the science type in the secondary period as a whole becomes more definitely established, there should be fewer pupils who are repeaters and at the same time fewer who have already covered ground which the new unit contemplates. Nevertheless, so long as pupils are admitted from other systems, skilful and open-minded exploration will nearly always reveal individuals of the type to which reference has just been made. On the other hand, the number of pupils who show self-dependent study indications should be steadily on the increase.

Such economy as we have discussed of course applies to the individual pupil and to his progress through the school, to the reduction of retardation and to the reduction of the time required for general education. There is another type of economy which arises out of the stimulus to more efficient course and program organization and pedagogical procedure afforded by the revelations of adequate exploration. Let us illustrate.

The exploration on a given unit may reveal, as it frequently does reveal, a very inadequate background as applied to that particular unit. The disclosure should not be taken necessarily to imply a reflection upon the character of the pupils' previous learning in school nor upon the quality of the teaching which they may have encountered. The presumption is that an additional unit should be introduced or that the order of units should be changed or that in some other way a better apperceptive sequence should be organized. Thus does the character of procedure from year to year improve in the light of intelligent experimental teaching, and this is experimental teaching.

Again, the exploration on the first unit of a relatively advanced course may easily exclude a considerable fraction of the class as being not ready for the course at all. For example, a senior-high-school course in United States history is extremely unlikely to

register with a group of pupils who are densely ignorant of events and characters and the elementary meanings in the field. In that event, such a group should obviously be segregated as a section and be treated on the assumption that they know no such history at all. More than that, competent administration will find out on positive grounds the reason for the finding and take steps to see that the waste does not happen again.

On the other hand, a series of explorations properly interpreted serves in part as a functional distance test on the actuality of earlier masteries. Understandings which the class is presumed to have mastered in earlier courses may turn out not to have been in fact acquired. This is likely to be the case in the physical sciences with reference to earlier arithmetical learning or in history with reference to earlier geography and perhaps earlier history. Again, such a disclosure justifies no hasty conclusion that earlier teaching has been neglectful or incompetent; later teachers may get the same kind of disclosures with reference to the content of the present course. It does admonish us first of all to reconsider the diligence and effectiveness of earlier teachers, but it is further a warning to study the whole earlier procedure not only in its technique but in its method and in the placing of subject matter in the program of studies.

Exploration will perhaps more often make it clear that, while the class as a whole has a sufficient background for the new unit, individual pupils need some preliminary instruction in details. This is especially likely to be the case with the vocabulary of the new unit.

II

APPERCEPTIVE SEQUENCE.—The exploration serves an essential and constructive purpose in the learning process as applied to the new unit in the development of apperceptive sequence¹ and in thus making possible the establishment of motivation. For this

¹ We remind ourselves that apperceptive sequence is not necessarily logical sequence. Apperception is the process of piecing new learning on to existing experience. Logical sequence is sequence in argumentation.

purpose, the teacher asks many oral questions calculated to provoke class discussion touching the whole region of pupil experience of which the new unit is an extension and interpretation. For instance, in the "Survey of Civilization" course, for the junior high school, the second unit is "Civilization in the Great River Valleys." Now, it would be a stupid teacher indeed, during the year 1923-24, who would not have devoted a period or two at the beginning to a class discussion of the doings at the tomb of Tutenkhamon. It would be a torpid class which would then fail to exhibit some curiosity concerning the unit to which they were being introduced. It is not of course always possible to find so vivid a capital of ready-made experience from which to start, but if no background can be found either in the pupils' previous learning in school or in their out-of-school experience or both, then one of three things is true: either the teacher is inadequate, or the new material is not a unit, or the unit is badly misplaced.

In the earlier part of the secondary period, it is essential that not only that part of the pupil's apperceptive mass which has been acquired in school shall be brought into sequence with the new unit but also that part which is the result of his life out of school. Otherwise, his schooling is bound to be a bookish affair. In the later years, however, especially in the senior high school and early college, there should be a sufficient organized intellectual background to make connections with the common life obvious.

We adults are very much inclined to take for granted the experiences of childhood and youth in the light of our own experiences, and to assume that pupils will sense the connection of new book content with what they already know. Some pupils do sense the connection, and we set them down as "bright," deploring the stupidity of the mass of humanity as it appears in the schools. A more reasonable interpretation is that the few not only have acquired the requisite experiential background but that they happen to sense the connection between the new material and significant elements in that background. One frequently

encounters alert and sensitive girls to whom, in their own language, school science is "all Greek." The truth of the matter seems to be that the textbooks which they have used and the teaching which has been applied have all been founded upon experiences which are boy experiences and not girl experiences. The utility of adequate exploration here is to call to the surface in consciousness all varieties of experience upon which apperceptive sequence may be established in the different members of a class. The effect is greatly to decrease the chance character of the learning on the new unit and likewise the number of pupils whose education is an affair of lessons learned.

III

ORIENTATION OF THE TEACHER.—Finally, out of exploration comes the orientation of the teacher himself with reference to the presentation of the new unit and its subsequent management. It gives the teacher, or should give him, a sense of the point of view from which the new unit should be attacked with this particular class or section, and a sense of the points which must be safeguarded with respect to the needs of individual pupils. Even lecturers who deal with adult and presumably educated audiences are frequently chagrined because their statements have been given an absurdly wrong meaning by some of their hearers. The reason is of course to be found in the principle that we all of us read meaning into statements in accordance with our own content in consciousness upon which the statements impinge or which they evoke. How much more is this likely to be the case in the teaching of children and young people who are still in the process of accumulating and organizing experience! It is a commonplace of parental and teaching experience to hear the exclamation, "You never know what is going on in their topsy-turvy heads!" Now the public lecturer cannot very well conduct an exploration period at the beginning of every discourse, although some of us might well accomplish a rough equivalent by estimating our audiences better than we do. In teaching in the secondary

period, however, it is well within the power of the teacher to ascertain what is going on in their "topsy-turvy heads" before adding anything to the confusion.

IV

CONDUCT OF EXPLORATION.—If the teacher should feel obliged after exploration to list the intellectual content which he has discovered under such captions as Roman numeral I, capital A, major subdivision Arabic 1, minor division (*a*), and so on, he might present the appearance of great scientific thoroughness but he would find himself hopelessly inhibited and formal in his presentation. He may indeed find it very useful, before embarking on his management of the unit as such, to have prepared an extensive set of notes on the exploration. Nevertheless, if he has faithfully and with interest conducted this step in the teaching he will find himself possessed of a sense of the right point of view which will carry him effectively through a strong presentation.

How then, more specifically, should the exploration be conducted? In general, by either one, or preferably both, of two procedures, a written pre-test and an oral quiz and class discussion.

A written pre-test, provided it is skilfully prepared with due understanding of the use which it is designed to serve, is the more exact basis of procedure. If the exploration stops there, however, it is likely to be a routine and formal affair. The pre-test should be extended enough to explore the intellectual background of the whole class upon the unit as a whole and so constructed that it tests understanding as well as informational content. It should contain test items so simple that they are likely to be reacted to properly by a majority of the class and others so searching that they are likely to be answered by none except pupils who may properly be released from study of the unit. There should be no time limit. The class should be properly motivated. They may be told, for instance, "We are going to study for some days [or perhaps weeks] about ———. It will be interesting to find out how much you know about it already. Perhaps some of you un-

derstand ——— so well already that you will not need to study it at all in this course. Perhaps others know almost nothing about it. Well, that won't matter; we should like to see what you all do know. So do your best."

In mathematics and grammar, the pre-test, of course, deals wholly with grasp of principles or understanding, and it can therefore be formulated with the greater assurance. It should not, however, contain items which presume familiarity with the specific assimilative material which the teacher proposes to use in the study period. In the case of the unit "Factoring" referred to above, for instance, the test items may well cover the ground of the essentials of the unit. They may well extend from a question like "What are the factors of 6?" which tests the pupil's fundamental notion of factoring itself, to questions like "Write the factors of the expression $a^2 + b^2 + 2ab - x^2 + 2xy - y^2$," which will disclose the pupil's ability to apply a principle of factoring in algebra to a simple concrete situation. In general, there should be more than one item dealing with a particular principle so that we may avoid as far as possible misfire questions (questions the purport of which does not register in the mind of the pupil), on the one hand, and mere superficial errors, on the other. For instance, there may be three or four questions like the first above. If the pupil reacts correctly to three of the four, or two of the three, we may reasonably conclude that he has the fundamental notion and that, if we were to point out to him that he is wrong on one or two of his responses he would see his error and correct it. On the other hand, if he is right on one and wrong on the others, we must conclude that he is hazy on the point at issue or that perhaps his right answer was only a chance answer. The test focuses upon disclosures of the pupil's present intellectual content and not upon the relative value of his performance with the test material.

In the physical and social sciences the written pre-test is not nearly so simple a matter, for here we need to test informational background as well as understanding. It is furthermore difficult

to avoid the complications of mere performance with the test material—the examination situation. The underlying principles referred to in the last paragraph, however, apply. Our chief reliance is upon the true-and-false or the multiple-response forms of the test material. Let us consider a history unit entitled “The Westward Movement” by way of illustration. The following will illustrate the kind of pre-test which can advantageously be used and some of its items.

There are several questions on this paper and under each question several answers which might be given. Some of these answers are good ones and some of them bad. Check the answers which you think are good with \checkmark and those which you think are bad with \times .

1. What is meant by the term “Westward Movement in United States History”?
 - a) The trappers in the Rocky Mountains
 - b) The settlement of Kentucky
 - c) Reclaiming the dry lands
 - d) Excursions to the Yellowstone Park
 - e) The founding of Chicago
 - f) The founding of Buffalo, N.Y.
 - g) The founding of Portland, Me.
 - h) Making homes on the prairie
2. Who were some of the great men in the Westward Movement?
 - a) John Adams
 - b) General Grant
 - c) Andrew Jackson
 - d) Henry W. Longfellow
 - e) John C. Calhoun
 - f) La Salle
 - g) Daniel Boone
 - h) Buffalo Bill
 - i) Cyrus W. McCormick
 - j) James J. Hill
3. Why did people move West?
 - a) Because land was cheap
 - b) To find gold in California

- c) Because the government sent them to fight Indians
 - d) Because it was hard to find jobs in the East
 - e) To found new homes
 - f) To hunt buffalo
 - g) To see the country
 - h) To get better farms
4. What nationalities settled the West?
- a) Italians
 - b) Swedes and Norwegians
 - c) Descendants of the original colonists
 - d) The Irish
 - e) The Polish
 - f) The Germans

Four questions are listed by way of illustration of the appropriate type of question. The pre-test as a whole should run to perhaps eight or ten.

A similar conception of the pre-test will apply in general science, in physics, chemistry, biology, in the social sciences other than history, in short in all subjects in which content is varied and extensive.

DRAWING CONCLUSIONS.—In evaluating and drawing conclusions from the pre-test, the central question is, "What is the test disclosure touching the pupil's intellectual content and background?" Not, "How does he compare with other pupils?" And not, "What is his score?" As we read the test papers and ponder over their meaning, we shall probably be able to sort them into two groups, or possibly three.

The pupils whose papers fall in the lowest group check the items correctly and incorrectly in about equal proportions, checking some of the absurd proposals as good answers and some of the good answers as wrong. We conclude that we have no ground for supposing that they have any substantial background for the unit at all.

A better group is composed of those who check the answers preponderatingly right but with several false estimates. They avoid checking as rights the absurd responses, but they do not

show the discrimination which a competent knowledge of the unit presumes. In Question 1, they check *c*) and *f*) wrong; in Question 3, they check *b*) right, and in Question 4 they check *f*) wrong. The fair conclusion is that their background for the study of the unit is adequate, and the teacher realizes that he may proceed with some confidence.

Perhaps one or two check discriminatingly every one of the answers proposed, and in the subsequent oral discussion reveal an abundance of the essential knowledge required. After some further individual questioning the teacher concludes that these pupils may be released on the unit.

Neither the written pre-test nor the oral discussion on the unit in the subjects which have an extensive content is alone ideally sufficient. The written pre-test tends to become formalistic, it is almost impossible to make it cover the requisite ground, and it is unlikely to yield any substantial motivation. On the other hand, the exploration by oral quiz and discussion is wholly lacking in elements of precision as applied to the individuals of which the class is composed. The oral discussion may yield apparently brilliant results in the class as a whole when in fact the chief contribution comes from a few pupils. Conversely, the teacher who stands before the class and directs his oral quiz from point to point in terms of the responses received is much more likely to cover the whole ground with respect to the intellectual content of the particular group before him, and the play of personality in this kind of exploration is more likely to arouse curiosity touching the new unit than is the case with the written pre-test.

PUPILS WHO ARE NOT READY.—The question may well be raised, What is to be done with the individuals who exhibit minds which are substantially blank with reference to any content on the new unit? In the first place, such pupils have a previous history and the effect of the exploration may be to carry farther the process of identifying them as problem cases and diagnosing their difficulties. On the other hand, certain pupils may show no problem-case characteristics; they have exhibited the same re-

sults on all exploration periods and yet have in due time arrived at mastery. Such pupils work at a disadvantage, but as long as they find their way the teacher need not be greatly concerned except to keep them in mind and guide them during assimilation to as much of the needful background material as will serve their purposes. Still others, especially in mathematics, show no background, their school experience has been a jumble of non-learning and the get-by attitude. They have exhibited the same characteristic on one or two previous units and have come through to mastery uncertainly and with difficulty. They are problem cases of the experiential type which are treated more fully in chapters xv and xxx. The appropriate treatment is either to turn them back to an antecedent course conducted on mastery principles or to assign them to a remedial group. It is uneconomical in the highest degree to hold them in the regular class group.

Exploration having been completed, in perhaps a single day in mathematics or in two or three days in subjects with a more extensive content, the teacher turns to his supreme opportunity in presentation.

PRESENTATION

There should be a definite break between exploration and presentation. Ordinarily, the exploration will be brought to a close on one day and the presentation will be deferred to the next. There is no assignment between the two days. The class meets the teacher with minds in the attitude established by the exploration, with apperceptive mass brought to the focus of consciousness and organized, and with curiosity aroused. The teacher approaches the task of imparting in its major essentials in a single period, if possible, the understanding which is the unit. In brief, through direct, convincing oral presentation he teaches the unit itself.

V

The process can perhaps be made clearer through concrete illustrations, and for this purpose let us take first a unit in mathe-

matics, perhaps multiplication at about third- or fourth-grade level. Owing to limitations of space, we can give but the barest outline.

IN MATHEMATICS.—If there are seven children in each of the five rows of seats in this room, you know how many there are in the room. There are 7 times 5 [writes] children in the room or 35 in all. Now perhaps there are 35 children in each of 8 rooms in this building and we should like to know how many there are in the building as a whole. There would be 35 times 8 [writes] children in the whole building, but you do not know yet how to multiply 35 by 8 and I am going to show you. We shall put 35 on the board and put the 8 under the 5 and draw a line in this way [illustrates]. Now we say that 8 times 5 is forty. We put down the 0 under the 5 and the 8 and save the 4 [writes]. Next we say 8 times 3 is 24 and the 4 we saved makes 28. So we put down the 28 in front of the 0 [does it]. And we see that there are 280 children in the building.

She works two or three others in this simple form and then takes a step in advance.

The Roosevelt School is a big building which has 24 rooms and there are 32 children in each room. This is the way we find out how many children there are in the Roosevelt School. We set down the 32 and under it we place the 24 like this [illustrates]. Now we say 4 times 2 are 8 and put down the 8 under the 2 and the 4. Next we say 4 times 3 [points] are 12 and put down the 12 in front of the 8 [points] and we have 128. Now we begin with the 2 in 24, this 2 [points]. We say 2 times 2 [points] are 4 and we put down the 4 under the 2 in 24. Then we say 2 times 3 are 6 and we put the 6 down here in front of the 4 [points]. Our work so far looks like this [illustrates]. Now we draw a line and add 128 and 64 in this way [does it]. Now we have 768. We call 128 and 64 the "partial products" and 768 the "whole product" or just the "product." So there are 768 children in the Roosevelt building.

The teacher works out two or three examples of each of the types which we have used, introducing in the second type factors which involve some carrying. She then proceeds to the heart of the matter with an example like 978 times 467, which she treats

in the same manner, and works several more like it until she senses that the class has probably caught the idea. By this time, the thirty-minute period is perhaps at an end and the class is dismissed without assignment. The following day the teacher works one or two more of the last type and assigns similar examples to be worked as a presentation test. Perhaps the presentation has required less time and there is opportunity for test on the first day, and this is desirable if it is possible.

Now observe that no questions have been asked, no arithmetical theory announced, and no rules set up. The teacher has simply taught to the point at which she senses that the root of the matter has registered in the minds of the pupils, and then she tests to see if she is right. She lingers on no details. The processes exhibited by the simpler examples are involved in the more difficult type. If she were to linger on the details of the simple forms, she would set up inhibitions to the effect that all these steps are very difficult when, as a matter of fact, the unit itself once mastered carries along with it its details.

Such is the type of presentation in mathematics and grammar throughout the secondary period, from the simple units of arithmetic in the elementary school to the calculus of the junior college.

IN SCIENCE OR HISTORY.—Presentation in a science or in a history unit is somewhat different in its outward aspects from that used in mathematics, but its fundamental nature and pedagogical purpose are the same. For purposes of illustration, a presentation in junior high school elementary science is offered. The unit was "Sending Messages by Electricity." The phraseology is adapted from a stenographic report.

SENDING MESSAGES BY ELECTRICITY²

The idea of using electricity for communication is old. You remember that one of the early discoveries in electricity was static electricity

² As one reads the presentation, he can readily see from point to point where the later assimilative material will fill in and round out the pupil's understanding. For the convenience of the reader, such points have been indicated by *.

and you remember that if we take a pith ball, hang it to a string and then bring a charged body close up to it, the ball is attracted over to the charged body. Now the earliest methods of communicating by electricity that we know of took place about the middle of the eighteenth century and what they tried to do was this: They got a long wire and around the wire they put insulation of some description. They would bring a charged amber rod over here [draws on the board] and over here [points] they would have a little ball. What would happen is that the current would flow through the wire and attract the pith ball to it. They had a wire for every letter of the alphabet. They would bring the amber up to a certain wire and the pith ball would fly over and say "This is A" and so on until a word had been spelled out. That was very slow.

Since that time we have had a great many better instruments for communicating by electricity. We have the telegraph, the telephone, the electric bell, the buzzer, the wireless telegraph, and the wireless telephone. Now every system of communication has four requirements.

The first requirement is a source of electricity. The source can be a cell, as in the case of an electric bell or a telegraph where the message is sent a short distance and a powerful current is not needed. Or it may be a dynamo, if a powerful current is required, as in the case of the wireless.*

The second requirement is a means of carrying the current. This means is a wire in the case of the telegraph or telephone or electric bell.* In the case of the wireless it is the ether with which all space is filled. Waves are set up in the ether and these spread in all directions until some of them strike the aerial of the receiving station.

The third requirement for a system is a transmitter. The purpose of the transmitter is to complete the circuit and start the current going.

In an electrical bell, this is the bell [demonstrates]; the cells here are the source of current; here is the push-button.* When I push down on the button, I release the electrons so that the current of electricity can go through the wire.* The push-button acts as the transmitter and completes the circuit. In the telegraph system we have another device. This we call the "telegraph key" [demonstrates]. The current comes from the cell, passes through the key and along the wire* to this [demonstrates], which is called the "sounder." The telegraph key does the same as the push-button; it completes the circuit and when the current

goes through the wire you get this [sound of a click]. The clicks which come from the sounder are arranged into a code which is called the Morse alphabet.* Each letter of the alphabet has a combination of clicks which stand for it and so a message can be spelled out.*

In the telephone, the transmitter is really much the same but still somewhat different. The transmitter of a telephone is a moving diaphragm something like this [demonstrates].* Waves of air are made by the source of sound such as the voice.* You all know that sound itself is due to vibrations. I can illustrate that in this way. Here is a tuning fork. I can set it in vibration and you hear a sound. That is middle *C*. If you look closely, you can see the fork vibrating. Every note has its own peculiar number of vibrations and the sound of the voice is only a succession of notes which we learn to recognize as words.* Now when one talks into the transmitter of a telephone [demonstrates] what actually happens is this: The vibrations set up by the voice strike the diaphragm here [demonstrates] and make it vibrate much as the tuning fork did,* only it does not vibrate to one single pitch like middle *C* but rather copies all the many different vibrations in our voices.* Now the diaphragm is so connected electrically that it makes the current in the wire vary as the vibrations vary.* So there are set up in this way a lot of electric waves which make a sort of electric current copy of the voice. You will find out later in detail just exactly how that takes place.* The current passes through the receiver at the other end and makes that reproduce the vibrations just as they entered the transmitter and so we hear a sound just like what set the diaphragm to vibrating and that sound is the voice speaking.

In the wireless telegraph, we use an induction coil like this [demonstrates]. You see I can make a spark. Now that spark sets up a certain kind of waves in the ether called "oscillations." It is something like this [illustrates]. We can make the oscillations vary as we wish just as we could make the sounds with the telegraph key vary. So we can send a set of signals out into the ether just as we sent them along the wire with the telegraph key. Our aerial is so arranged that it will catch these oscillations and vary an electric current in such a way that we get a sound to match every sound which was started from the distant station where the spark was made.

The next requirement for sending messages by electricity is a receiver.

In the electric bell, the bell itself is the receiver. See this electro-magnet [demonstrates]. When the current is sent through the wire and through the coils of the electro-magnet, the magnet attracts the clapper and the bell rings.* When the push-button is released, the bell stops.

In the telegraph receiver you have the same thing. When the key is closed in the distant station, the current flows along the wire and through these electro-magnets.* They become magnetic and this part [demonstrates] flies down and makes the sound [click]. When the key is released, it is pulled back by the spring.* So the receiver, you see, will make just the same sounds the key makes.

In the telephone receiver you have the same thing as in the bell and the telegraph sounder. Here is the electro-magnet* and here the movable diaphragm. [Demonstrates with a dissected receiver.] The current flows through the coils of the magnet from the distant transmitter.* You remember that the vibrating diaphragm in the transmitter made the current vary in strength.* When a strong impulse comes through the magnet it attracts this diaphragm in the receiver strongly and a weak impulse attracts it weakly.* So the diaphragm in the receiver copies exactly the vibrations in the diaphragm of the transmitter and this diaphragm in the receiver makes sound waves in the air which strike the ear just like the sound waves made by a voice in the same room and we hear what our friend who is speaking into the distant transmitter says.*

The receiver for a wireless is too complicated for us now. Perhaps somebody will choose it some time for an extra project.

So there are four requirements for a system of electric communication:

First, there must be a source of current.

Second, you have to have some means of carrying the current.

Third, you must have a transmitter or some device for regulating the current strength.

Fourth, you must have a receiver and the receiver must be capable of changing electric waves into sound waves so that they affect the ear.

VI

A SKETCH AND NOT A FINISHED PICTURE.—It will be observed that the presentation is a sketch and not a finished picture.

Detail is reduced to the minimum. The instructor is not concerned to present the unit in precise terms. The reader who is versed in the subject will note that there are various statements which would fall short of satisfying the specialist, but the essence of the matter is that they are true as far as they go and that they serve to convey to pupils at the junior-high-school level a valid notion of the unit, to set up in them an intelligent attitude toward that aspect of their environment which is the use of electricity as a means of communicating messages. A complete account of the nature of current flow in the wire, for instance, would not only throw the presentation out of its proper focus but would be likely to throw the minds of the pupils into confusion by giving them a broader scope than they could assimilate. It would be attempting to cover two units at once.

The two concrete illustrations which we have given will serve as examples of all presentations in the science type. Of course the second of the two is illustrative of a much wider field. To it will conform all presentations in the physical, biological, and earth sciences, in economics, sociology, and politics, and in history. We might go farther and exhibit illustrations from each of these fields but this chapter is already becoming long and we have still a considerable distance to travel. Rather let us turn to some important practical precepts touching the conduct of presentation.

WHAT A PRESENTATION IS NOT.—It will be noted that the teacher is presenting the unit "Sending Messages by Electricity." He is not teaching the construction of the telephone or telegraph. With the unit in mind, it is easy for him to pick out the essentials which emphasize the idea of message-sending. He is not easily diverted into the pathway of mere unrelated knowledge accumulation nor does he wander into the refinements of appliance construction.

Again, the instructor did not indulge in an attempt to present the unit by asking questions about it. In other words, he did not attempt to develop understanding by "making the pupils think" when they had little or nothing to think about. He relied not at

all on the heuristic method. That was over and done with in exploration. He relied rather on straight expository explanation of a definite body of related concepts.

Finally, he is not trying to tell the pupils all he knows about the subject. They will greatly expand their experience in the assimilation period.

IMPORTANCE OF CONTROL TECHNIQUE.—There is little hope of effective presentation unless the teacher applies effective control technique. The teacher from whom this presentation was taken commonly shows close to 100-per-cent group attention. If the teacher allows a part of the group attention to wander, he will need to re-present, not once but many times for that reason alone. We have already set forth the principles under which group attention is secured and held (see p. 136). Of these principles we shall reiterate two.

PERSONALITY IN THE TEACHER.—The first of these is the exertion of that indefinite and vague but no less real thing called "personality" in the teacher. All of us have it, in varying degrees perhaps, but equal to the demands of the situation in all except the upper regions of the secondary school, but we are not all of us willing to exert it. It is easier to follow the pathway of least resistance and hear lessons. Effective teaching requires exertion: effective presentation requires a great deal of exertion. At no point is the issue more sharply drawn than here. On the other hand, it is a rare individual who, being indoctrinated with the notion that he has a personal force which he can exert if he will, fails to do so.

An illustration of an inexcusably poor presentation or college lecture is that of a teacher who drones, remains in his seat, indulges in the habit spasm of allowing his fingers to play over his lips while talking, directs his gaze away from his class instead of at them.

TEACHER'S COMMAND OF SUBJECT MATTER.—The other of the two principles which we must reiterate in connection with the establishment of the high group control required by presentation

is complete mastery of the unit by the teacher himself, a familiarity which goes beyond anything required of the pupils. If the teacher stumbles and halts or if he is confined to notes or to frequent references to a text, group attention will quickly evaporate. If, on the other hand, he is a master of the unit, if he is so thoroughly familiar with his subject matter that he can free his mind largely from details and hold his class in the focus of his own attention, he is likely to make a good presentation and to exert substantially perfect group control. Hence, there is implied not primarily mastery of the subject itself, although that should not be minimized, but complete familiarity with those aspects of the subject which constitute the content of the course being taught. There is further implied full preparation on subject matter before presentation is attempted.

A good practical suggestion for effective presentation from the standpoint of control of subject matter is contained in the following. In the first place, the teacher should find time to think over and digest the unit as he himself understands it, without reference to book material. If he feels that the latter is needful, he should review his books first of all. Second, he should think over the matter in terms of getting it to the class before him. Third, he should write down in outline the points which he has made in his mind to make and then leave his outline at home. It is not difficult for each of us to recognize the difference in our teaching between a day on which our subject matter has been duly pondered beforehand and one on which we have met our classes without such meditation, albeit our knowledge is fundamentally the same on one day as on the other.

CAN TEACHERS DO IT?—A teacher sometimes remarks, "Oh, I can never lecture that way," and again, "Public-school teachers as a class could never make these presentations." The author thought so himself until a group of fifth-grade public-school teachers suggested the presentation and convinced him that it could be done. In fact, every time a teacher makes an explanation to a class he makes a presentation. If a teacher cannot explain, he

cannot teach in the science type. However, every teacher who knows his subject matter well enough to teach it, and who is willing to make the exertion required, will find that he can train himself into the faculty of good presentation. It is an art and, like all such, it is learned only by practice backed up by the desire and the vision of success.

NOT LECTURING.—It is not sufficient to expound principles or subject matter without thought of their registration in the minds of the pupils. To do so would indeed be merely to lecture. Presentation implies that the teacher is not merely expounding but that he is also following the minds of his class in order to sense, so far as he can, whether or not the pupils are “taking it in.” In other words, *rappport* testing must be going on throughout even the most intimate phases of the teaching process itself. The teacher is not teaching until he can sense whether or not the class is getting his message as he teaches. Now in the presentation this involves explaining and going back for further explanation on this point or that until the consciousness comes that the class is going along with the teacher. The illustrative presentations which we have offered show little or none of this, for it cannot be shown in print, but in the ordinary routine there will be much of it. In mathematics or grammar, the teacher will keep on working illustrative examples until he senses that the point has registered. In science or history he will repeat a point which he is making with further and better illustrations. Indeed, in science-type subjects, there is no teaching unless the teacher is able to say of a new point, “It is like this (referring to something he knows to be in the pupils’ minds)” ; and conversely no pupil is prepared to learn a unit unless his experience is such that the teacher can make such statements. The guidance is found in the faces of the pupils, for there is in most cases a tendency for faces to light up as a point becomes clear. Without good *rappport* testing, other testing becomes formalistic and inconclusive. Reliance on *rappport* alone, however, amounts to only little more than guesswork.

Hence, when the teacher feels reasonably confident that his presentation has registered, he proceeds to his presentation test.

PRESENTATION TEST

It should be noted that the test has not for its purpose the grading of pupils but solely the purpose of ascertaining whether or not the presentation has registered and with what pupils it has not registered.

In mathematics, throughout the whole secondary period, the most convenient method of administering such a test is to send the class to the boards with typical examples, one to each pupil, all of about the same degree of difficulty, and none of them with any problem feature calling for the exercise of special ingenuity.

Similarly in grammar, if the unit has to do with sentence structure, the class is given typical sentences illustrating the principles taught, and they are directed to identify the significant parts. If the unit deals with such matters as tense, agreement, and the like, the class is given a series of true-and-false test items.

VII

THE ISSUE.—Now, the issue of the test is, Has the pupil apparently caught the notion? Does the pupil's response so indicate? The papers are not scored, for there is no particular need of comparing one pupil with another. On the tests in which each pupil is given a single example, those who correctly apply the principle taught are counted successful and the others not. On the series of true-and-false items, the principles already discussed in the administration of the pre-test are applied. In the end, the teacher sorts the responses into two groups, the one composed of those who have satisfied him that they have caught the major essentials taught in the presentation, and the other composed of (1) those who have not satisfied him and (2) those who have satisfied him that they have not caught the notion at all.

TWO FORMS OF TEST.—In the extended-content subjects, two methods of administering the presentation test are open. On the

one hand, a series of true-and-false or multiple-response items can be set up for the class, the issue in all of the several groups of items being clear and simple and of about the same order of difficulty. On the other, each pupil may be asked to write a presentation test paper explaining to the teacher what the teacher has explained to the class.

If the first form of test is used, the issue is discrimination between learning and non-learning on the principles already described in the pre-test. If the second form is used, the teacher sorts the papers as before, placing in one group those which satisfy him that the pupils have grasped the main ideas, and in the other both those which do not satisfy him and those which satisfy him that the writers have not grasped the argument. The first form of test has the merit of somewhat greater precision, and in it the element of performance testing is at the minimum. Conversely, it tends to become formalistic and to tempt the teacher subconsciously to make his presentations more a matter of content than of understanding. The second form has the defect of combining a test of performance with a test of comprehension, that is, it tests both the pupil's ability to express himself and his understanding of the presentation. On the other hand, the second form gives greater latitude to the pupil, and the group of papers as a whole is therefore likely to throw more light on the result and to prove more illuminating to the teacher. It is perhaps well to use both forms, varying as the teacher passes from unit to unit, or to use one form on the presentation and the other on re-presentation. The teacher is concerned wholly with getting the most light and the best light on the effect of teaching. On the whole, the author prefers the second form of test, admitting all its defects.

In the first place, pupils who are accustomed to its use are thereby trained to become better and more effective listeners. Again and again, adults have been tested under the same conditions as a class of high-school pupils on the same presentation and with the same opportunity to write the test paper. Almost invariably the adults' papers are among the poorest in the class.

The children have been trained to assimilate oral presentation and to express themselves concisely and comprehensively, and the adults have not been so trained.

Again, as in recitation later in the unit teaching, the written expression is a valuable means of focusing and organizing in the pupils' minds the preliminary learning. It is further a valuable means of training in English writing which, we contend, is inseparable from the mastery of elements of understanding. In the end, we test a complex of understanding and expression, but this is well, since in effect we say to ourselves, "Our purpose here is to so present this unit that the pupil will not only understand but will express his understanding."

VIII

RE-PRESENTATION^a

In the early part of a course, or in a school which is first attempting to teach to the mastery level, in a class which is composed of pupils who have been brought up on the lesson-learning tradition, there are few units, indeed, in which the presentation test shows no occasion for re-presentation. In a school which has been free to try out mastery teaching under the best obtainable conditions, the early units in a new course frequently require three reteachings before the teacher has succeeded in establishing his presentation and in segregating his problem cases. Such is the pathway of thoroughness. Toward the end of the course, few pupils require more than one reteaching, and the presentation registers with the majority on the first attempt. Such is the product of thorough training.

With the test material in hand, the teacher's first task is to study it, to identify the weak points in the presentation, to note wherein and why it failed to register with this particular class on this particular unit. He will also note the peculiarities of individual pupil response as part of his basis for future corrective

^a See also mastery formula, chap. vi, p. 81.

work. It is perhaps worth while to enumerate some of the points with respect to which a presentation is likely to have been ineffective, though it should not be understood that the list is by any means all inclusive.

1. The control technique was poor
2. The teacher undertook to make his presentation without first thoroughly saturating himself with his subject matter
3. The presentation was not well organized—the few points which tell the story clearly in mind and clearly developed
4. It attempted to sketch into the picture too much detail
5. It failed to connect up with the pupils' present stock of ideas on the unit as revealed by exploration and consequently went over their heads
6. The teacher's tone and personal attitude were listless and unconvincing

Carefully thinking out the reason for failure of presentation is the heart of the whole matter. Here, as elsewhere in the reteaching member of the systematic teaching formula, mere repetition gets nowhere. Redirection of teaching is of the essence of teaching.

Finally, the teacher will consider the unit itself from the standpoint of presentation and note his conclusions for revision of the unit in the next organization of the course. One of the tests of a unit is the practicability of presenting it.

When exploration and presentation have been successfully accomplished, motivation has been established and the lights have been turned on. The process may be likened to giving the student a prolonged airplane view of a city which he is required thoroughly to investigate.

CHAPTER XV

ASSIMILATION

AT the end of the presentation period, the classroom is organized as a study-room in which day after day the pupils carry on the process of study which constitutes the assimilation stage in the learning of a unit.

RELATION IN CITIZENSHIP.—When we consider the ever present problem of training children and youth for citizenship in a nation which has political institutions like our own, our first list of objectives is likely to include “ability to form independent judgments,” or some other expression which implies the ability to form and hold individual opinion in the place of the habit of accepting opinion ready-made from the press and the propaganda of the day. Such ability is no other than that of the student. If we can train up a generation of students, we can educate a generation which will be capable of formulating rational public opinion, even in the midst of the complexities of the modern world, and not otherwise. It cannot be done by mere process of presenting both sides of unsettled questions to immature youth. That simply generates loose thinking and arrogance in the self-assertive, and bewilderment in the sober-minded. As a youth of the latter type remarked, “They lead you into a dark hole and blow out the candle.” The assimilation period in the science type is the chief opportunity which the school affords for the development of pupils into students.

I

WHAT IS ASSIMILATION?—When the pupil hands in his successful presentation test, he simply proves that he sees the unit in its bold outlines as the teacher sees it. That is the acceptable and necessary first step. He must go on now and assimilate the

new unit into that complex of attitudes toward the world which constitutes his intellectual self. In brief, he makes the new understanding his own by prolonged contact with the assimilative material. The process may perhaps be given a more concrete meaning if we consider the analogy of nutritional assimilation, although analogies must not be pushed too far.

In the latter, the pupil is engaged in a process of physical growth just as in his learning he is engaged in a process of intellectual growth. In both cases, nature's purpose seems to be to provide for his survival and for his proper contribution to the evolution of the race into higher forms. In his physical growth, he ingests his food and drink, breaks them up and builds their elements into his physical self. He does not store away in undigested form the bread which he eats, to be used as he has need of it. He is modified day by day, becomes a stronger and more capable individual, but he does not become less an individual. In his intellectual assimilation, he ponders over new material and new principles. They find places in the body of his attitudes toward the world and he becomes, to some extent, a modified and more capable individual in that he can better interpret the complex affairs in which his life is passed. He does not store away the new principles as objective content in memory to be used when needed.

We can pursue the analogy farther. The pupil sometimes eats unwholesome food, and his bodily organism is thrown out of adjustment for the time being. Likewise, he sometimes cherishes ideas which are not true, and his attitude toward the world becomes perverted and warped. He may take in food which is not in itself harmful but which does not nourish, and he ceases to grow. Likewise, he encounters much in his learning which he does not assimilate, and he ceases to grow intellectually. Perhaps that is the case with a great many people.

The meaning and significance of assimilation can possibly be made clearer by noting the difference between individuals who have assimilated their learning and those who have not.

We sometimes encounter a mechanic, or even a technologist possessed of a university degree, who exhibits the characteristics of non-assimilation. He talks the jargon of his trade more volubly than does his more soundly accomplished confrère; he successfully meets all ordinary situations which he can interpret by the book, but he brings no ingenuity to bear. You take your case to him, he gives you a ready opinion, performs a bit of work, and perhaps the operation is a success. Subsequently, you find that he ignored a perfectly simple factor affecting this particular case. The whole laborious and expensive treatment was unnecessary and it may have been dangerous. He is the product of the shop, and has learned to do what other men have told him to do and to understand his principles as they have been taught to him. As a practitioner in a scientific field, he is forever quoting what he calls "the authorities." The opposite type of worker studies the job, whether it be a defective plumbing fixture, a problem in accounting, or a congested jaw, in terms of the particular situation in which it is found. He uses few words and makes an economical use of principles, but he applies the simplest possible treatment and it works. The onlooker concludes that he is possessed of common sense, but common sense is simply the endowment which actual assimilation of the requisite principles has given him. He does not proclaim that a formula is true because the authorities say it is true but rather that the authorities say so because it is true. If he does not know, he admits his ignorance, while the other man takes refuge in his vocabulary. This man has studied his principles and they have made him an effective thinker in the field in which he works, but he applies himself to the task and not his catalogue of principles. He has assimilated his principles and the other man has not.

ASSIMILATION AND STUDY.—Effective assimilation and learning to study are mutually related. Opportunity for assimilation is opportunity for study, and effective guidance in assimilation is training in the art of study. Now the time-honored demand that

pupils shall be taught to study is much like the demand that they shall be taught to think. Cut-and-dried rules for study, like similar rules for thinking, for the most part get nowhere. Study is a language art and, as in all such, consciousness of method inhibits rather than assists the learning process. One student graphically expressed the principle when he said, "I spend so much time hunting for the central idea that I forget what it is all about." Like M. Jourdain who so admired prose and was astonished to find that he had been speaking prose all his life, so the pupil who is surrounded with the learning-to-study mystery may well be surprised to learn that he has in reality been studying all his life out of school as well as in school. For the practical pursuit which we call "study" in the science type of learning, the most that is required is a motive, an objective, the needed tools of study, and material. Given these, any normal pupil will study. The chief responsibility of the teacher and the school is to provide the pupil with these elements, but that is often a task requiring the most thoughtful scrutiny of pupil behavior. Beyond these elements, there are occasionally needed bits of advice which help the pupil in the direction of more economical and efficient study. The effective content of most books written under such titles as *The Art of Study* is chiefly a body of principles which apply to one of the tools of study, namely, reading.¹

If the exploration and presentation have been at all effective; a motive for studying the new material has been established and

¹ The nature of reading itself is widely misunderstood, largely on account of persistent mistaking of performance for learning. A standardized test carefully graded from easy to difficult test items is administered and it is observed that some pupils score better than others. Hence they read better. We cherish the delusion that we are "increasing reading ability." Nothing of the kind. I have seen some results of accurately photographing perceptual responses of a series of fourth-grade and high-school pupils and college students on the same piece of reading material. The eye movements which are known to be characteristic of reading as reading were much the same for the college students as for the fourth-grade pupils. I have before me the similar plates of a French test running from sixth grade up through high-school and college freshmen to members of the French Department itself (see page 501). The eye-movement pattern which we know to be character-

the pupils have been made conscious of the objective, that is, what it definitely is that they are now about to learn. As unit follows unit and course follows course, motives should become deepened and clarified, objectives should become multiplied, and more of them will originate in the pupil's own purposes.

Studying the unit is learning to use in study the tools which have been acquired in their more fundamental aspects elsewhere. Reading, mathematics, graphic illustration, English writing, are perhaps the principal tools which the pupil learns to apply and by learning to apply learns to study and by studying assimilates. It is not a question of first acquiring the tools to perfection and then learning to study to perfection and then studying. It is all one process. The pupil learns to read geography, for instance, by studying geography, and by learning to read he learns in part not how to study, but studying. Every unit in a science-type course, when effectively mastered, is an addition to the pupil's stock of study tools because it is an addition to his reading capacity and to his methods of thinking.

A large part of the teacher's function in assimilation is the assembling of the material of study and putting the pupil in effective contact with his material. When he has developed into a student, the pupil will have learned how to seek his own material and will no longer need the teacher's intimate guidance and supervision. When a meager textbook is the only material of study, it is not to be wondered at that the pupil does not learn to study. He has no chance.

istic of true reading was the same for a sixth-grade pupil and the specially proficient members of the faculty. Reading is reading. When one has learned to read, he will never read any more truly, although he may learn to read more rapidly as he attains practice in the use of the ability.

What accounts for different scores on a graded comprehension test, assuming that all pupils tested are reading at the level of the adaptation, is a wide range of difference in the ideational content of the pupils. You and I, dear reader, would score miserably if we were given a comprehension test on wholly unfamiliar material—let us say a technological account of recent Hittite explorations.

II

THE CLASSROOM.—Let us then turn to a picture of the classroom in the science type organized as a study-room for the assimilation period.

In the first place, the traditional conception of the classroom as a place in which the class is to meet day after day, mainly for the purpose of reporting on what they have prepared outside, disappears altogether. Instead of that, the class appears from day to day for its regular appointment in its study-room in precisely the same manner in which the teacher presumably retires to his own study at home for certain hours during the day. It will continue to do so until the assimilation period on the unit has been completed. Now this implies several new conceptions touching the classroom, its physical arrangement and its equipment.

The formal arrangement of schoolroom seats and desks is more or less a handicap, but still it will do. The ideal is an equipment of simple tables with tops which have a sufficient area to accommodate the charts with which the pupil is likely to have to work. The seat is a substantial chair so constructed that it is not likely to develop squeaks with use. An ideal arrangement of schoolroom furniture necessarily requires somewhat more floor space per pupil in attendance than is the case with the ordinary type and arrangement of furniture. The excess space required is, however, a small matter when compared with the lavish use of space for corridors and other non-classroom purposes so commonly found.

In the laboratory sciences, laboratory exercises, if they are employed at all, are clearly a part of the assimilation period, while lecture-table demonstration belongs to the presentation. Ideally, a lecture table, study desks, and laboratory tables should be combined in a single room. During assimilation, pupils should be individually free to come and go between their study desks and the laboratory tables. To separate the laboratory and the study-room means that either the class must go to the labora-

tory as a group or else an assistant teacher must be employed for the laboratory. The maintenance of a small lecture-room for demonstration purposes also runs at cross-purposes with the classroom technique to be employed, since, while the class is together on the first presentation, groups of pupils will be released to begin assimilation before the class as a whole is released. Further, the maintenance of such a room for the accommodation of the small class groups which are appropriate to science instruction in the secondary period seems to be a wasteful and rather purposeless attempt to copy the physical arrangement which is perhaps needed in the medical school or for lecture rooms in other departments of the university.

However, the room arrangement is a minor matter. Given a thorough teacher, an appropriate procedure, and an adequate equipment, much can be accomplished even in very illy-adapted rooms.

III

EQUIPMENT.—Except in the laboratory sciences, the ordinary classroom is apt to be a bare sort of place. As long as it is used only for the purpose of hearing recitations which have been prepared outside, nothing more is needed. The pupil does not, however, study advantageously under such conditions. He requires a workroom in which are collected the materials upon which he is for the time being dependent. Pupils are not likely to learn how to study if they have nothing to study.

In the first place, there should be on the walls charts which show plainly the constants in use in the subjects for which the room is assigned. It is a waste of time in history to spend a large part of a course in memorizing the purely chronological data which help to form the framework within which the pupil thinks and studies. A history room should have charts for instant reference and constant reminder which exhibit such material. Similarly, a physics room should exhibit charts of the principal constants, which are ordinarily found only in the appendix of the

text. There they serve only to encourage the lexicon habit. And so with mathematics, grammar, economics, nutrition, chemistry, and other subjects. In addition, the geographical subjects need the appropriate wall-map equipment.

In the second place, the room should contain, not only the few reference books required, but also the body of substantial content material which the pupils will have occasion to use, many books chosen from the school library and returned to the library when no longer needed for classroom study. Of the same nature as book material is periodical literature. Every classroom should contain the regular numbers of the special periodicals dealing with the subject being studied, which are not too technical for the pupils to read. Even the somewhat advanced technical periodicals should be on file for the use of the teacher and the few pupils who develop special interests in the subject.

Finally, there is the matter of laboratory appliances. Laboratory material in the science type in the secondary school should be limited to what the pupils can use. The use of such material in the assimilation period is limited to the need of putting the pupil within reach of experience which can best arise out of physical contact with concrete appliances and observation of the processes in their physical manifestation. Assimilation is learning from experience, and in science the most illuminating experience often arises out of the contemplation of processes at work. The only justification for assigning a laboratory exercise to be worked is an affirmative answer to the question, Will the exercise proposed make better assimilative material than a demonstration which the teacher can present or a certain series of pages in the assigned reading? If the apparatus assigned for use is so elaborate that the pupil is obliged to learn a difficult task of manipulation, it is extremely unlikely that any particular assimilative value on the unit itself will be contributed. There is seldom, in the secondary period, any possibility of effective assimilative use of high-powered microscopes, elaborate electrical equipment, sensitive balances, extended arrays of reagent bottles, and

the like. These, for the most part, belong to the period of specialization.²

If an essential piece of assimilative experience, particularly in the biological and earth sciences, can be found only in a field trip, the teacher must have vigor and executive ability enough to arrange and carry out such trips.

Such is the description of a study-room adequately equipped. Equipment is very much more important than the physical arrangement of the room, but lack of adequate equipment is not an obstacle which blocks the possibility of teaching under mastery principles. Even though there is nothing available other than a single textbook, a thoroughly earnest and sincere teacher can secure results which are much more real than is possible under the daily lesson-assignment procedure. The assimilation will be brief and perhaps meager, but it will be none the less assimilation contributing to understanding and somewhat to ability to study. Further, as the years go on, equipment will accumulate.

² Justification of the very elaborate and exceedingly expensive high-school and junior-college laboratories which are commonly supplied to departments in chemistry, physics, biology, and the practical arts has recently been challenged. The verdict of such studies as have been made is on the whole that the laboratories do not justify themselves and it is stated that it has been "proved" that they are of little or no value. The scientific method commonly employed to effect the proof is at least as questionable as the laboratories themselves. Since similar methods of investigation have had a wide range of application, reaching all the way from the "phonic method" of teaching reading to the influence of the size of class in the university, a brief warning to teachers and students of education is perhaps not out of place. In general all such methods tend to be very bad inductive reasoning.

The method is commonly that of the controlled experiment. Mr. A selects two groups of pupils of as nearly as possible equal ability and he industriously eliminates all the variables he can think of, but he does not validate his own classroom technique, his material of instruction, his test material—save as he secures a statistical validation on the basis of unvalidated assumptions—or his theory of education. He eventually "proves" ordinarily a negative, that is, he proves that there is not much difference between two procedures—lecture table and laboratory in this case. The sad thing is that we do not know whether A could teach by any method. The value of ten thousand such experiments would be wiped out if a single Mr. B should show that an expensive and elaborate high-school laboratory could be made to produce results quite beyond what lecture-table demonstrations can do, *provided Mr. B could analyze his results and show why his facts are what*

The classroom being arranged as a study and the proper equipment provided, it is useful to look into the rooms and view classes at work.

IV

CLASSES AT WORK.—In the first room we visit, every pupil is at work on his own individual problem. Some are struggling still in the early stages. Others are going steadily and prosperously forward. Two or three have completed assimilation on this unit and are working on special voluntary projects. One has completed and is utilizing the study period for work on another subject in which he is finding difficulty. The teacher tells us that still another has been released for a few days for additional class work as a visitor in a language course in which he is a slow learner. Now and then a pupil in a history class which we visit passes quietly to the book tables, consults several books intently, selects one, and returns to his seat. In a chemistry class, a pupil gathers up his papers, makes a final rapid survey of what he has done, slips a rubber band about them, and lays them aside. He then passes to the laboratory table, selects and arranges apparatus, and begins work on an exercise.

they are. A single issue would then arise: Is Mr. B's procedure essential to the educative process. If the answer be in the affirmative, then we must all learn somehow to do what Mr. B does and find the money for equipment.

The specific question is typical of questions the answers to which cannot be arrived at experimentally. The problem is historical and analytical, and experimentation is valuable only for the purpose of fact-finding on specific points in the analysis.

Laboratories, as we now know them, are the product of a period in which it was hoped to utilize the sciences for the purpose of developing ability to think inductively, that is to develop scientific method, to teach sciences by making scientists. The original purpose went by the board along with the doctrine of formal discipline and with the emergence of the adjustment theory of education. Whether the laboratory is valuable for the purposes suggested in the text is at least doubtful. That our elaborate laboratories can be justified as appurtenances of general education is scarcely open to doubt; they have no purpose in general education. They belong to the period of specialized training in which the primary purpose is to develop investigators, that is, professional people who will know how to settle moot points which arise in professional practice. In other words, the writer agrees with the findings of recent studies, but not on the grounds which they elaborate.

In one of the rooms, the teacher is passing quietly and rapidly about the room from pupil to pupil. As he stops at the desk of one, evidently for individual instruction, he glances about the room, notes a raised hand, and nods to the pupil. The pupil thus recognized continues with his work and presently the teacher, having set the first pupil right, proceeds to the desk of the second, where a prolonged colloquy takes place. One after another, other pupils gather about the desk, and presently the teacher announces to the class, "Several of you seem to be having trouble with ———. I don't wonder. Here is what is troubling you." In a few minutes, their faces say, "Oh, yes, I see," and study goes on. While the teacher is speaking, some of the pupils glance up and listen for a moment, but most of these resume their study. Evidently the point in question is not troubling them.

In another room, the teacher is sitting quietly at his desk. Study is proceeding, apparently with few if any individual difficulties. Presently the teacher nods to a pupil, the latter takes a chair at the desk, and a prolonged interview follows. We note that the teacher asks a great many questions. After the pupil returns to his own seat, the teacher remarks to us, *sotto voce*, "That is one of my problem cases. He is a slow worker and I suspect a reading case. He is coming to me this afternoon for some tests."

In all these rooms, group application is near 100 per cent, but in the next room we visit the aspect is very different. The teacher is sitting at his desk evidently in an irritated and nervous frame of mind, a pupil is seated by him, and a queue of others reaches halfway down one of the aisles. Pupils here and there in the room are dawdling. Evidently the teacher's concern for control technique is nil. We become curious and ask the principal who is with us to explain. "Yes," he replies, "that teacher has been visited, helped, coached, and reasoned with but nothing seems to do any good. I have sent him to observe one of the teachers you visited but without effect. I am afraid it isn't in him. He leaves at the end of the semester. We have another who is going with him and perhaps you would like to visit that room."

We accordingly enter another room. The teacher is seated at his desk correcting papers. The pupils are in various attitudes of unrest and idleness. Some of them are "visiting." Others are merely idling and occasionally glancing at the clock. One girl is reading a novel. The teacher glances up for a moment and calls out, "Freda, put that book away and go to work." As we leave the room, the principal remarks, "Well, that is better than common; he is usually doing nothing at all. He leaves the building promptly at the close of school. Never to my knowledge does any studying on his own account. His out-of-school hours are all spent either at a club downtown or else on the golf links. He is simply plain lazy and this supervised-study idea he considers just so much extra spare time. He used to be very popular with a certain set of pupils because he was easy on his grades, but, since we have given up grades, people like A and B whom you visited are the popular teachers. And, at that, I don't think it is so much popularity as that the youngsters respect them and enjoy their work."

V

EXPLANATION AND SUB-PRESENTATION.—The implication of our description of the class at work in the assimilation period is that the period is wholly one of studying books or other similar material or else work at laboratory exercises, that the teacher's direct oral presentation came to an end in the presentation period. Not so. In spite of the fact that study with books is indeed the dominant and essential characteristic of the period, there are often occasions for the teacher's direct oral presentation within the assimilation period.

One of the teachers whom we visited had occasion to interrupt study for oral explanation of a point which he found was troubling enough of the pupils to lead him to recognize it as being of major importance. Let us call this procedure *explanation*. Sometimes a great deal of it is required, but the teacher needs to be on his guard not to fall into the temptation to talk too much. The need of explanation is in itself evidence that the assimilative ma-

terial is either insufficient or not well focused or perhaps lacking in clarity. The teacher should keep notes and in the reorganization of the unit for the next course endeavor to correct the fault. Other things being equal, more explanation is required in the early stages of the secondary period than in the later.

Some units at high-school level are so extended that *sub-presentations* on the elements are needed. The presentation deals with the unit as a whole. Then each of these major elements is given a sub-presentation within the assimilation period when the class as a whole reaches the point. Some of the more successful students, however, pass over these points without taking the successive sub-presentations, and some of the more mature classes need none. While the principle of sub-presentation must be recognized, its tendency to lead the teacher astray must also be kept clearly in mind.

VI

THE SUPERVISION OF STUDY.—The assimilation period is obviously one of supervised study.

Now the terms "supervised" and "directed" as applied to study have certain unfortunate connotations. The essence of supervised study is the provision of right opportunity for study and training in study habits and not the supervision of study if by supervision is meant compelling the pupils to study according to the teacher's preconceptions or according to formal rules, and still less if it means merely that the teacher presides at the desk and watches the pupils at work. As we have seen, the conditions of study are motives, objectives, the needed tools, the material. Supervised study has chiefly to do with the tools and the material. It is further concerned with the development of that volitional basis for study which we call the "power of sustained application."

READING.—The study tool par excellence is reading. In fact, that form of study which consists in learning from books is in the main simply intensive and extensive reading. We may well utilize this principle as our point of departure.

Let us assume that our pupils when they were at second- or third-grade level did in fact attain the primary reading adaptation, that is, that they became able to read the thought of the printed page without focal consciousness of words and other isolated elements. We are likely to find some even in the senior high school and junior college who have not done so, and these we shall consider later, together with other problem cases. Pupils who have arrived at the reading adaptation and who have read abundantly and extensively have usually still to learn the art of reading intensively, which may be defined as "getting the thought and all the thought."

INTENSIVE.—The teacher of reading recognizes the principle and provides for specific instruction in intensive reading at the regular reading period. Such a plan of campaign must rest on the expectation of transfer of training. If we continue this process of general training in intensive reading, we shall undoubtedly secure progressively higher scores on tests given for the purpose of measuring the ability which is being developed. But shall we get a transfer to intensive reading ability in arithmetic, geography, history, science, and so on? We shall get varying amounts of transfer in different pupils depending upon the chance that the pupil has developed wholly or in part a generalized adaptation, that is to say, that he has come to see that this power which he is acquiring applies to everything he reads. Chance is the negation of systematic procedure. If we adopt here as our specific objective generalized ability in intensive reading, we shall succeed only if we use materials from every sort of reading which the pupil has to use. Intensive reading in mathematics is one thing, in geography another, in natural science a third, and so on. In each, the ability is in part conditioned on the concepts peculiar to the subject. Evidently, then, the use of reading periods for training pupils in the art of intensive reading implies practically that all the content subjects, including literature, shall be taught in the reading period, a palpable absurdity. Hence, let us turn the problem about and look at the other side. Instead of training pupils

in intensive reading in a reading class, let us utilize intensive reading as the most important aspect of study in the assimilation period in science-type subjects throughout the school and recognize the principle that development of intensive reading ability is simply development of one form of study ability.

TECHNIQUE.—We may then imagine ourselves at the beginning of the assimilation period in arithmetic, or in an extensive content subject, in the early elementary part of the secondary period. One of the first things to do will be to select a series of problems from the arithmetic, or a passage from the basal text in another subject, and focus upon it a series of written questions touching the content and requiring intensive reading. The pupils, with books open before them, find the answers from the text and write them. The items of the test are then scored right and wrong, and the scored test paper of each pupil is returned. The teacher now takes the book and the pupils' papers and a period of instruction something like the following takes place:

"Nobody could find the answer to Question 7, and yet the book says plainly ———. You all see it now.

"Fred answers Question 11 in this way [quotes], and yet the book says just this. Fred did not read carefully.

"George and Henry and Mabel didn't find the answer to Question 5, but everybody else did. So it must be that these pupils could have done so if they had read carefully enough, for you see how plainly it says ———.

"Now, we are all going to try again and see how much we can improve our scores."

The training effect is much the same as that of the sustained-application profile described in chapter ix. The pupil is made acutely conscious of what is required of him, he is shown where in his failure consists, and he is induced to improve his score. But that is not enough. Improving his score in the subject which he is studying will in most cases result merely in improving his score unless the pupil is convinced that he has thus learned an art which is of great value to him in all his study both now and henceforth.

Several other similar tests on other material are given during the assimilation period and the results compared with those of the first test, which was set before the period of training began. And so the process is continued throughout the elementary school, perhaps throughout the junior high school, and very possibly well into the senior high school and junior college. If systematic teaching is new in the school, certainly nothing should be taken for granted touching the abilities of senior-high-school and junior-college pupils.

Even before the end of the elementary-school period, certain pupils will show intensive reading ability fully up to the requirements of the course in which they are studying. Such pupils are then released from training. The effect of such release is three-fold. It saves time and energy. It gives us a definite and positive piece of evidence bearing upon individual-study superiority. More important than either, it is another experience among many which help the pupils all to realize that learning is an inward growth and not merely satisfying the teacher with acceptable performance. The pupils who are released from training at, let us say, fifth-grade level may need, however, to be brought under training again when they reach the more mature and exacting material of the high school. Early test results and failure of certain pupils to improve under training may set off the early problem cases and throw some preliminary light on the correct diagnoses.

EXTENSIVE.—Such specific, systematic training in intensive reading ability is the foundation of training in study ability, but as time goes on and more extended reading material is used for study purposes, pupils will probably need to be given many bits of advice as to methods of reading extensively. Such training is, however, language-arts teaching and it must conform to the principles of that type (see chap. xxiii). The important consideration is that the pupil must not be made focally conscious of details of method. He should not, for instance, be told first to look for this and then for that. Instruction must be directed to the reading in

its extensive aspect, and pupil consciousness must be focused upon the reading as a whole. For instance, in their extensive reading, pupils may be told first to read a whole chapter and let the general drift manifest itself; then to read it again and perhaps a third time until the understanding seems to come to them clearly and they begin to feel a sense of familiarity; finally, to note relatively obscure passages and to read them intensively. The objective is to train pupils not in reading intensively material which is in its nature extensive but rather to train them in thoroughly reading extensive material.

TECHNIQUE.—To give advice touching extensive reading is not enough; we must ascertain whether or not the advice has taken effect. For this purpose, much the same sort of test is employed as in the case of intensive reading. A passage is chosen, preferably from a book in the hands of the pupils to which extensive reading is appropriate. A set of questions is prepared, calculated to bring out the salient points which the passage read is intended to elucidate. The passage chosen is long enough and the questions asked are numerous enough so that no pupil is likely to read the whole passage and react correctly to all the test items in the time allowed. The time allowance is of any convenient length, not too long to destroy the value of the test—say from two to five minutes, depending upon the level in the school career at which the test is given. Instructions are given somewhat in the following manner:

“We are going to try to find out how well you can rapidly read a passage in one of your books and still catch as much of the meaning as possible. For that purpose we shall use a passage beginning at ——— on page ——— of [naming the book]. Let us find the place now. Have all found it?

“Very well. Now when I give the signal, begin to read and read about as you usually do with this book until I give the signal ‘Stop.’ Then mark a circle around the last word read and lay the books aside.”

This part of the test is carried out, the test questions, which

have already been distributed and have been lying face down on the desks, are taken up and the questions answered. The pupils are then instructed to count words read and write the numbers on their test papers. The papers are then scored, the results distributed in much the form indicated later for assimilation testing, and the exhibit placed before the class. The teacher thus has, first, an extensive reading test; and, second, a rate test on extensive reading. Each pupil has a concrete exhibit of his achievement, and he thus becomes aware of his shortcomings and their nature. The process of training now begins.

"I think that perhaps it would be interesting tomorrow," says the teacher, "to see how much we can improve our scores on this same test." This procedure tends to accomplish two things. In the first place, when the scores of the retest are compared with those of the original and with those attained on subsequent fresh test material, the pupils who have a lesson-learning tendency are noted. The lesson-learners will tend to show an abrupt improvement on the second application of the original test, only to fall back to the first level on a later new test. Second, the pupils enter upon the retest with a consciousness of the nature of specific deficiencies and secure practice in improving performance with respect to those deficiencies. They acquire an experience of improvement. The class is then told that a new test will be given within perhaps a week, and the intention is to see how much improvement there will be. The process is repeated at intervals throughout the assimilation and should similarly be done in other courses which are using extensive material.

As in all testing, the results of which are used as guides in corrective teaching, the teacher is less concerned with the test scores than with analysis of the test results. It is the latter which gives us our best light upon the pupil and his needs. Here, for instance, is a pupil who reads very rapidly and partly for that reason makes a high score. Another reads slowly and similarly makes a low score. If now we compare the two in terms of the number of words read per test question correctly answered, we find that the second

has a better record. In still another case, the pupil has read very slowly but he has answered correctly every question within the scope of the ground he has covered. Number 1 needs to be told not to read less rapidly but to improve his assimilation of what he reads. Number 2 should hold fast to his assimilative ability but try to read more rapidly. Number 3 is probably reading intensively, and he should be made aware of the difference between the two kinds of reading.

Reading is the fundamental and most important study tool, but it is not the only one. Perhaps next in order is handwriting.

HANDWRITING.—The presentation test, the assimilation period, the written recitation, in fact all school work in which pupil reaction is important, rests heavily upon the rate and legibility of handwriting. Let us remind ourselves that the only concrete and objective means we possess of getting at the pupil's essential thought process is found in his written expression. We can observe his thinking more or less within his spoken discourse, but we cannot take the latter away with us for study and investigation.

Within certain limitations, it is relatively easy to develop the handwriting skills in a handwriting period, but the skills thus developed transfer to handwriting in general only as the individual pupil acquires a handwriting ideal, and this is a matter of chance, apart from systematic mastery development. The inescapable conditions of schoolroom work require that this generalized adaptation must be set up in the growing pupil through training in every situation in which he has occasion to use handwriting. If the teacher is concerned with handwriting only in the handwriting period or if only a special handwriting teacher is so concerned, the pupil, in all but the chance cases, relapses into his naïve performance when the specific constraint is removed. Hence, every teacher in every period in which handwriting is used, until the required skills have been permanently established, must be a handwriting teacher. This does not imply that the handwriting drill must be carried on in the content subjects.

That is constructive work which belongs properly to the handwriting period. It does mean, however, that the teacher in other periods must heed such matters as handwriting position and pen-holding, and above all must accept from each pupil only his standard performance. The appropriate attitude for the teacher to take when a slovenly paper is handed in is the following:

"Frank, my boy, this is the way you write when you try (exhibiting a good paper). Now look at this paper and see how different it is. The purpose of your practice in handwriting is to teach you to write well whenever you write at all. It is of no use for you to give me a paper like this for I shall always turn it back to be done over again." Frank's rejoinder is likely to be, "But, Miss ——, if I try hard on my handwriting, I can't think what to write." The answer is, "Yes, I understand how that is, but that is one of the things you have to learn to do. You will soon learn to write well and be able to think all the time you are writing."

In the establishment of good handwriting habits, legibility is of course the primary consideration, in the sense that rate which is gained at the expense of legibility is of little value from any point of view. Rate is, nevertheless, in itself the practically valuable product from the point of view of use as a tool. One encounters cases in which rate is abnormally slow; the pupil requires an incredible amount of time for putting in writing the simplest passage. Some of these are the problem cases which require remedial reconstruction of the fundamental writing adaptation. As to the others, much the same procedure is used which has been described in the case of rate in reading. The pupil is not pushed beyond his natural reactive rate, but stimulus and guidance are applied to bring him up to his normal rate.

MATHEMATICAL CONCEPTS AND PROCESSES.—A third fundamental tool in study is the application of the mathematical concepts and processes which the pupil has learned in arithmetic or in other mathematics. There seem to be two considerations involved here. In the first place, application to situations found in science,

the home economics courses, and shop are good functional tests of the reality of the learning products assumed to have been established in mathematics courses; and, second, the courses last named are parts of the total situation in which the pupil masters his mathematics. Let us consider the last point first.

If the school holds that all mathematics must be finally and definitely mastered in the mathematics period or department, then it must arrange to have all subjects in which mathematics is used taught by the mathematics department, an evident impossibility. The alternative is to have mathematical applications taught by all the departments in which mathematics is used, as well as by the mathematics department. Now the practical problem most commonly met here is much the same as that met in reading, handwriting, and composition. Pupils become so thoroughly and fundamentally obsessed with the lesson-learning attitude and the idea of satisfactory class performance that they do not generalize their learning. This is mathematics. This principle the pupil has learned; he can apply it to any problem which the mathematics teacher proposes. And yet if the same principle and problem appear in physics or the shop he stands helpless. In brief, a part of the mathematics learning product is apparently a volitional adaptation in terms of which the learner makes the effort to use the principle wherever it is needed. The teacher's attitude should be, "You have learned that principle for I have talked with Mr. ——— and he tells me that you have. Now you must use it when you need it. Your trouble is not that you do not know; you do not make the effort to apply."

Now the mathematics department of the high school, and the elementary-school teacher in the arithmetic period, have a heavy responsibility for generalizing the teaching, as they go along through the course, by convincing the pupil that what is learned in mathematics is not only usable but must be used constantly in the school and in life outside the school. Likewise, as we have already seen, the assimilative material in the mathematics unit must be so selected from the pupil's actual experience, includ-

ing his school experience, that his learning will be capable of generalization. None the less, the teachers in other than mathematics periods or departments have an equal responsibility for contributing their essential part to the establishment of the generalization when such is necessary. If they confine themselves to deploring the failure of the mathematics teaching, they will not only fail to do their part but they will exert a positively detrimental influence in convincing the pupil anew that his education depends upon the teacher entirely and on himself not at all. In the senior high school and junior college especially, the attitude of the teacher may well be, "You are presumed to have learned this elementary arithmetic or algebra or geometry. You cannot make progress in this course without such learning. I am not going to teach you over again. I advise you to secure a text and re-teach yourself."

GRAPHIC REPRESENTATION.—A study tool which is often overlooked is that of graphic representation. The pupil who has the ability to sketch rapidly and correctly the appliances and to picture correctly the processes found in the physical, biological, and earth sciences is in possession of a tool which is of immense assistance in establishing effective assimilation and sense of reality. Precisely the same principles which apply to the use of reading, handwriting, and mathematical principles and processes in study apply to the use of drawing. Precisely the same type of co-ordination between different subjects and different departments is required. If the pupil has been effectively taught the art of graphic representation so that it will function outside of the drawing period and the art department, he will tend naturally to make large use of the ability in his study of science-type units. If he has been effectively taught and does not use the ability, it is the business of the teacher who is teaching him how to study to see that he does use his ability in the situations in which its use is serviceable. If he has not been effectively taught in drawing, it is still important that the supervisor of study shall not only show him how to use

such ability as he has but shall give the class simple lessons in such drawing as is needed and useful.

LABORATORY.—In the physical and biological sciences, particularly in the senior high school and junior college, laboratory exercises belong to the assimilation period and are an important part of the teacher's concern in supervised study, assuming that reliance is placed on laboratories at all rather than on lecture-table demonstration.

Laboratory exercises which are carried on independently of any effective supervision are pretty apt to be perfunctory at the best and dawdling periods of loafing at the worst. In the early part of a first course in laboratory science, several explanatory class exercises in the mere manipulation of apparatus are usually necessary. Beyond that, individual pupils need to be watched in this respect and shown the right way of doing things instead of being allowed to perform in a bungling and wholly childish fashion (see also chapters on the practical-arts type).

Laboratory exercises imply laboratory notebooks, not the kind in which everything is prearranged for the pupil so that he has nothing to do but enter the data which are called for by the blank spaces, but preferably notebooks of ample and convenient size made up of blank pages and so arranged that pages of co-ordinate paper and the like can be inserted as needed. When the pupil has worked out his exercise, made his notes on slips of paper, and finally written up the exercise in his own way without the stereotyped conclusion "From this we learn, etc.," he brings the book to the teacher, who accepts it as a creditable and significant piece of work or else rejects it and sends the pupil back to re-write or perhaps to go over the whole exercise from the beginning.

SUSTAINED APPLICATION.—Supervised study is further concerned with training which goes to the root of all effort, namely, ability to work whole-heartedly and continuously, that is to say, sustained application. In chapter ix we have seen the bearing of this problem and the process which is calculated to lead to its solution. It only remains to note that while sustained application

is critical of learning power throughout the school, it is required in the assimilation period in science-type subjects more vitally than anywhere else. Treatment of the problem in chapter ix is essentially a part of the exposition of the principles of supervised study.

WRITTEN EXPRESSION.—Finally, an essential tool of study is the effective use of English writing. We have had, however, and shall have occasion to study its use in other connections (see especially chaps. xvi and xxv), and hence need only to note here that it is such a tool. It is, in fact, of much more significance in other parts of the teaching cycle than in assimilation.

In our consideration of the tools of study, the use and development of which is a large part of the teacher's duty in supervised study, it is constantly apparent that effective study is in large part a function of school co-ordination and integrity. Hence the supervision of the school as a whole has a very large part to play in the development of study capacity in the pupils. If each department in a school which is concerned with the general education of youth is going its own way, absorbed in its own problems, with scant concern for the process of education as such, the effect will be seen in ineffective study habits perhaps more than in any other one respect.

Training pupils in their use of the tools of study, co-ordinating and focusing such use upon the study of units in subjects which belong to the science type, is the principal practical task of the teacher in supervised study throughout the secondary period. When an individual pupil has in fact arrived at the point at which he needs no such training, he is to that extent ready for university work proper.

VII

THE GUIDE SHEET

THE MATERIALS OF STUDY.—The materials of study are of course in the main books, not a single basal text out of which les-

sons are conned, but books. An extremely important element in teaching pupils how to study is teaching them to read, not assigned paragraphs or pages, but in some instances volumes and in other instances to gather pertinent information from books without reading entire volumes.

Books are not the only sources of enlightenment but they are the essential instruments with which study is done. There is likely to be a wealth of illustrative material outside the books which are found on the study-room book tables. If the pupils are invited to bring in all the material touching upon the unit which they can find, there will not only appear in the classroom an abundance of newspaper clippings, pictorial illustrations, science and history realien, additional book material loaned from home libraries, and the like, but, what is more important, there will be established in the pupils a useful awareness that not all the needful material of learning is found in the textbook or even in the school.

Nevertheless, the prime business of the assimilation period in the science type is to train pupils in the ability to study. For this purpose, they require systematic guidance and out of this need has arisen the *guide sheet*.

STRUCTURE OF THE GUIDE SHEET.—Since the first edition of this work was published, there has been a considerable evolution of the guide sheet in the science type. Looked upon at first as being simply a useful device for the assimilation period, it has come to be a part of the structure of the unit arranged for study purposes. The unit once determined, the three major divisions of the teaching structure are the *unit elements*, the *guide sheet*, and the *test material*.

As we have repeatedly seen, the essence of the learning process in the science type is reflective thinking and the heart of reflective thinking is problem-solving. Hence the guide sheet is a series of problems focused upon the several elements in succession and upon the unit as a whole, that is to say, so chosen that the solution of each is a bit of practice in thinking out the unit learning. Nec-

essarily, each problem is an application of the principle or principles being learned. Texts in mathematics have very commonly been guide sheets, some of them excellent in construction, some of them mediocre or poor.

The problems in history and the sciences are not, however, all of them such as require solution in the ordinary sense. Some of them may be activities in which the pupil is required to place himself in a situation in which he must argue out an application of a principle. A suggestion for one such activity in a guide sheet on the unit "Independence" in the early course in United States History has been that the pupils imagine themselves to be members of the Committee of Correspondence in one of the colonies writing to members of a corresponding committee in another colony.

SYSTEMATIC CONSTRUCTION.—It is possible to make considerable progress in the direction of formulating a truly scientific guide sheet by observing the following principles.

I. The complete assimilation of a unit would imply experience in the form of reflective thinking upon all the *types of situation* to which the unit could be applied.

IN MATHEMATICS.—For example, let us study certain concrete types of situations to the solution of which division in arithmetic is applicable in the list which follows:

1. Average of two or more numbers
2. One's share in group expenditure
3. Rate when time and distance are given
4. Time when rate and distance are given
5. Missing dimension when area and the other dimensions are given
6. Cost of one when total cost and number bought are given
7. Number bought when price and total cost are given
8. How long it takes to pay a certain amount of money in given installments
9. Changing denominate numbers to higher terms
10. Comparison—the ratio of one number to another

The type situations as expressed in the list are all within the actual or accessible experience of most if not all fourth-year pupils. So far as this is not true, an administrative problem in arranging ideational and experiential background is created.^a Further, experience in applying the unit learning to the several situations tends to set up patterns to which nearly all division situations can be assimilated. That is to say, the pupil is not likely to meet a situation in subsequent learning for which the teacher cannot say, "It is like this—" Thus apperceptive sequence. I follow the same teaching principle in the present exposition whenever I introduce a statement with the expression "For example" or "For instance." A great deal of half-learning in the school results from the fact that pupils have no such reflective patterns to which new experience can be referred. When the powerful "working-for-a-grade" motive is present, there is thus a strong tendency for lesson-learning to become established.

Now the interested arithmetician will note that there are in reality only four situations in the list, namely, average, partition, ratio, and one unknown in the presence of two knowns. But these are academic generalizations, classifications. They mean nothing in terms of learning. People do not learn from generalizations; they learn from experience. The intellectually mature person has generalized his learnings but he has learned the generalizations; they have not risen automatically, save by chance. Hence one of the major utilities of algebra in education: adequately taught it generalizes arithmetical learnings.

So much for the situation side of the guide sheet in arithmetic as typical of all mathematics. We recall that there is a process side and that processes themselves have both major and minor variations. The major variations occur in the element organization, but there are sundry difficulties which arise in process applications. Assimilation at its best implies that all such difficulties shall appear as practice items in the guide sheet. Typical are

^a See page 175.

those which have been worked out in the Laboratory Schools and elsewhere. The list follows.

1. Even-division facts
2. Short division with no carrying
3. Uneven division facts
4. Short division with carrying
5. Zero difficulties in short division
 - a) Zero in middle of dividend
 - b) Zero at end of dividend
 - c) Zero in middle of quotient
 - d) Zero at end of quotient
6. Long division, two-place divisors, the first figure of the divisor being used as the trial divisor and giving the correct quotient figures
7. Long division, two-place divisors, the trial divisor being one more than the first figure of the divisor and the trial quotient being the true quotient—e.g., $2808 \div 39$
8. Long division, two-place divisors, the first figure of the divisor being used as the trial divisor, but the true quotient figure one less than the trial quotient—e.g., $4214 \div 86$
9. Long division, two-place divisors, the trial divisor one greater than the first figure of the divisor and the true quotient one more than the trial quotient—e.g., $2337 \div 57$
10. Long division, zero in the quotient
 - a) Zero in the middle—e.g., $76190 \div 38$
 - b) Zero at the end—e.g., $124800 \div 26$
11. Long division, three-place divisors or more than three-place
12. Long division with remainder

Now the present work gives no guarantee that the foregoing is an exhaustive list either of problem situations or of process difficulties. It does, however, illustrate the process of building a systematic guide sheet, especially in mathematics, and by implication in grammar, but in other science-type subjects as well. It also suggests lines of productive research for the progressive teacher.

IN THE SCIENCES.—At the natural-history level in the sciences, the types of situations are found in the current experience of the

pupils, and in general problem activities are set up which compel reflective thinking in applying the principles of the unit. It will be found that each unit element has a variety of such situations. On the unit Water Supply, for example, it may well be that the close of the assimilation period will show rather an elaborate sketch of the city water system in the hands of each pupil, together with a coherent and accurate written description.

At the organized-science level, the situation types are the application of the principles found in the unit to the interpretation and explanation of activities found not only in the common experience of the pupils but also in expansion of their experience found in their assigned reading. For example, the unit Oxidation and Reduction may be applied in an elementary study of various industrial processes, not that the purpose is to study the smelting industry for instance but rather for the purpose of utilizing a brief study of the process for the purpose of assimilating the unit.

Similarly in economics, the fundamental unit Supply and Demand is studied through an investigation of various market situations, such for instance as elastic and inelastic supply, elastic and inelastic demand, place of the marginer in the competitive market, monopoly prices, purchasing power.

IN HISTORY.—In history, Bailey's assimilative problems furnish an excellent illustration of the structure of the guide sheet in terms of types of situation.⁴ Each of his problems calls for a brief notebook exposition at the hands of the pupil, clear in treatment and convincing in argument.

II. CONTENT.—The types of situation having been worked out, illustrative problems are furnished under each type. Sometimes, as in history and social science, the situation itself furnishes the only problem. At other times, as in mathematics, a great many problems may be required. In arithmetic we have found it to be desirable on some units to furnish a hundred or more. In still other instances, notably in senior-high-school and

⁴ Bailey, *A New Approach to American History*. University of Chicago Press, 1927.

junior-college physics, the number falls between the extremes, largely because mathematical problems are available and furnish the most critical media of learning.

It ought to be borne in mind that "training in problem-solving" is not an objective. Hence, there is no point whatever to the introduction of puzzles. On the contrary, the purpose is not practice in reflective thinking, but rather the use of reflective thinking in the attainment of a new attitude of intelligence. The problems should invariably be within reach of the existing experience of the pupils or else within reach of experience which can be made available through non-professional reading matter.

III. READING REFERENCES.—As we have seen, the heart of learning to study is not learning to get lessons but rather learning how to use books. Hence every guide sheet needs references to illuminating reading material bearing on the several problems, sometimes in the form of school texts, sometimes in the form of periodical or pamphlet material, sometimes in the form of standard popular treatises.

It is hard to overemphasize the importance of the last two types. One of the essential products of the secondary school is familiarity with the standard non-professional or semi-professional works in every field, or at least awareness of the nature and probable source of such material. The experience of the United States Department of Agriculture in being obliged to use the device of county agents in order to get its teachings to the public, despite the immense volume of material which it has published, is an impressive example of the failure of secondary schools to teach their pupils how to read in the fields in which they have been taught.

Reading references should appear of course on the published guide sheet in parallel with the type situations or problems as needed.

AT DIFFERENT LEVELS.—Experience shows that pupils can begin to learn to use a guide sheet as soon as they have learned to read. Necessarily, however, while the structure is in principle

the same for the youngest child in the secondary period as for junior-college students, the form and wording must be adapted to different levels of training.

In the elementary school as early as the fourth year, the guide sheet may be in the form of questions not unlike the "seek further" questions sometimes found at the end of chapters in textbooks; only each question is accompanied by one or more references. The pupil is required to keep a note-book in which he records his answers, and thus he takes his first steps in the art of study.

Later, the question form is dispensed with and the guide sheet contains simply references on the unit and its elements, while the teacher is always at hand to furnish necessary immediate and personal guidance.

Later still, some pupils who have been trained in study from the beginning of the secondary period dispense with the guide sheet altogether and use simply an outline of the course. These have ceased to be pupils and have become students. They are few and far between, even at college level, but our own experience as well as that of other schools leads me to think that there would be more of them even now if teachers would only learn to identify them and give them their chance.

THE ENTIRE GUIDE SHEET NOT AN ASSIGNMENT FOR ALL.—Even with an excellent guide sheet worked out, teachers and schools are prone to be under the dominance of the pupil-performance stereotype and not continuously aware of learning as the objective. Such people are likely to think of the guide sheet as a task to be worked out and thus to appraise the pupil's progress in terms of the completion thereof. If later on pupils fail on their assimilation tests, the logic of the situation is that something must be wrong with the pupils or else with the "method."

Not so. The guide sheet ideally should be more extended than the needs of any pupil require. Testing begins comparatively early in the assimilation period. As soon as pupils give evidence that assimilation has taken place, they are released, quite with-

out regard to the extent of guide sheet which they have covered. Thus, economy in the teaching process and an added conviction in the minds of the pupils as to the nature of learning.

THE PUBLISHED FORM.—The guide sheet must obviously be in the hands of the pupils and this requires some form of publication or at least issue to the pupils. Such issue may be nothing more than a blackboard outline. That is perhaps the best beginning, especially at the lower levels. It may be produced in mimeographed form, but in that case the mimeographed sheets should be competent pieces of workmanship. Placing blurred and otherwise unreadable material in the hands of pupils is inexcusable. Finally, it may be printed. A very useful procedure in the case of competent teachers and schools would be the experimental production of guide sheets from the blackboard stage up to the point at which the author is sure of his instrument and is ready to publish in printed form for general circulation.

SIMPLER FORM.—The systematic guide sheet described and explained in the foregoing pages, as we have seen, constitutes the unit developed for teaching purposes. To that extent, it is a step in the direction of making teaching an exact procedure, so far as teaching ever can be exact. Nevertheless, systematic teaching does not necessarily imply this more elaborate form. Any assignments during the assimilation period which are in the form of a series of activities effectively designed to make it necessary for the pupil to think out the applications of the learnings which are sketched by the Presentation, if accompanied by the essential reading references in the textbook or elsewhere, constitute a guide sheet.

VIII

THE PROBLEM CASE IN SUPERVISED STUDY.—Problem-case work is properly a volume by itself, and we shall have occasion to discuss it at some length in its relation to the whole matter of teaching in the secondary period. See Part IV, chapter xxx. Meantime, it is useful to note that analysis of the difficulties of

individual pupils is an essential feature of the supervision of study in science-type teaching.

In a very true sense, every pupil is a problem if we extend the term to cover the teacher's concern for every individual, but the term "problem pupil" implies one in whose personality there is either lack of some earlier learning which is essential to the present learning process or else some obstruction to learning. These critical ignorances or perversions turn up in all sorts of ways and of course the pupil is nearly always unaware of them. It is probably the rare educated adult who is without some of them, and nobody knows in his own case how much mischief may have been done. In the cases of people who have successfully matured, most such must have become eliminated. In the immature, they are in the nature of things more numerous and in many cases they prove to be the unnoted obstacles to the completion of education and perhaps to the enjoyment of a life which might otherwise have been successful.

Sometimes a pupil is found whose maladjustment is so extensive or profound that systematic remedial treatment out of class is required. The great majority of instances are mischances which are trivial in themselves, but which as time goes on become formidable in their consequences. Nor can any set of prescriptions be offered for dealing with such cases. In general, close observation of the pupil at work and the noting of significant facts in his intellectual processes will disclose clues which lead to the discovery of the nature of his difficulties. The corrective treatment required in most cases is simple, obvious and not infrequently trivial.

IX

ASSIMILATION TESTING.—The final mastery test, as far as the present teaching of the unit is concerned, comes in the assimilation period, but it is not deferred until all pupils have worked out the guide sheet. Nevertheless, the teacher and the school administration should recognize the principle that testing is never finished and that remote functional tests in later courses and other

activities will very probably throw much light on the reorganization of courses, corrections of the classroom technique, and revaluation of the teacher's efficiency. Here, as elsewhere, the test is for the purpose of discovering whether or not reteaching and corrective teaching need to be done and what needs to be done, and not for the purpose of grading the pupil.

FOLLOWING THE MIND OF THE PUPIL.—As soon as assimilation is fairly under way and the problem-case campaign for the unit has been launched, the teacher begins to estimate the progress of the different pupils toward genuine mastery of the unit. No definite rule can be given. If the supervision of study from day to day has been alert and faithful and the teacher has kept in contact with the individual pupils through the questions which they have raised, the suggestions which they have made, and through individual conference with them, he will sense that A, C, and M are approaching the full understanding for which the unit stands. If, on the other hand, he merely notes that the pupils have completed the assigned reading, and the prescribed round of exercises, he has no evidence at all touching mastery. He has merely evidence touching ground covered and performance accomplished which may or may not be related to the adaptation which mastery presumes.

This following the mind of the pupil to the point at which the teacher senses adaptation is another instance of *rapport* testing. It is subjective and uncertain and insufficient, but without it objective testing becomes wasteful and formalistic. It is especially useful in the identification of early mastery. Without it the teacher will be likely to defer the assimilation test proper until some of the pupils have become stale in the long assimilation period. For those who have not mastered and are nowhere within reach of mastery, the administration of the assimilation test will not only waste time but the results are the more liable to be deceptive. Two tests of different sorts are better than one, and an objective test following the teacher's *rapport* testing is very much better than an objective test applied before the teacher has any

idea whether or not learning has taken place, provided that in the end he does not allow his subjective opinion to override the plain revelations of the objective results.

THE OBJECTIVE TEST.—The essence of the objective assimilation test is that it shall focus upon the unit just as exploration, presentation, and assimilation have focused upon the unit. There is, however, one other type of testing which is commonly employed, the implications of which should be understood. We have in mind the scored performance test intended to spread the class.

The performance test, as applied to unit testing in the science type, consists of a series of test items all of them focused upon understanding and not upon assimilative material, and so arranged that all members of the class will be likely to react correctly to one or more of the items and that nobody will be likely to react to all. Now, even under the assumption that all have mastered, the class will tend to distribute itself symmetrically and possibly according to the law of chance distribution. The scores revealed are not evidences of mastery but rather evidences of what the several pupils can do with mastery if indeed they have it. In other words, a performance test of this sort is only another form of general intelligence test. As such it is useful when we wish to secure data on the individual pupils. It is an excellent device for the study of general learning capacity and for the comparison of capacity in one subject with that in another. But it is not a test of mastery. By the very assumption on which it is founded, some pupils will score who have by no means mastered, and we have no means of judging how much of a high score is traceable to general intelligence and how much to mastery.

The assimilation test proper is then one in which all questions are of about the same degree of difficulty and so stated that pupils who understand the unit will be likely to react correctly while those who do not understand will be likely to react incorrectly.

Conceivably, a single test question, if we could find an adequately comprehensive one, might suffice were it not for the practical possibility of mere chance being responsible for the right

response. The greater the number of questions, the less opportunity there is for chance to affect the total result. On the other hand, every pupil should have opportunity to finish the test. If a time limit is imposed, the test tends to become a performance test or a general-intelligence test. It should be remembered that we are not concerned here with the question of how A compares with B but with the much more vital question of whether A and B have both mastered.

SERVICEABLE FORM.—The most serviceable form has been found to be that of the multiple-response. The test used is like that already described in the case of exploration (see p. 264). Fundamentally, each question in such a test sets up a choice between three answers, one of which is obviously right to anybody who understands, but not to one who does not understand; one of which is wrong, and one irrelevant. A five-item multiple response test question is of course somewhat more searching than a three-item question. The pupil checks the right answer or answers thus, \checkmark , and marks those which are wrong with crosses. It should perhaps be noted that we have much better evidence of the pupil's state of mind when he marks both the right answers as right and one or more wrong answers as wrong than when he marks the best answer alone. The teacher then considers the result. In a given pupil's paper each response is checked by the teacher either right or wrong. Table VI will help to make the matter of administration clear. The Roman numerals across the top of the exhibit stand for the questions.

THE EVIDENCE.—The teacher now proceeds to consider the results. Plainly, the class as a whole is still vague on the unit.

Before setting the test, the teacher was confident that Pupils 2, 3, 8, and 15 had mastered. The test confirms his opinion with reference to Pupil 3 and upsets his opinion with reference to Pupil 15.

Now he notes that only one pupil reacted correctly to Question 3. Hence he suspects a "misfire," that is, that the purport of the question did not register as he had intended. He studies the

question, thinks he detects the cause, and after questioning some of the pupils his suspicion is verified. The question is corrected and the paper is filed for future use, perhaps with another section or in a later course. This decision puts Pupils 7 and 8 in the mastery group, and he had not previously suspected that Pupil 7 belonged there. He is still doubtful about Pupil 2, and further individual conference does not clear up the doubt. Pupils 9 and 11 are apparently problem cases, and Pupil 4 is known to be simply

TABLE VI
ASSIMILATION TEST RESULTS I

Pupil	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1.....	—	—	×	—	×	—	—	—	×	×	—	×
2.....	—	—	×	—	—	—	—	—	—	—	—	×
3.....	—	—	—	—	—	—	—	—	—	—	—	—
4.....	—	×	×	—	×	×	×	—	—	—	×	×
5.....	—	—	×	×	×	×	—	—	×	—	—	—
6.....	×	—	×	—	—	—	—	×	—	—	×	×
7.....	—	—	×	—	—	—	—	—	—	—	—	—
8.....	—	—	×	—	—	—	—	—	—	—	—	—
9.....	×	×	×	×	×	×	×	×	×	×	×	×
10.....	—	—	×	—	—	—	—	—	—	×	×	—
11.....	×	×	×	—	—	×	×	×	×	×	×	×
12.....	—	—	×	—	—	—	—	—	—	—	—	×
13.....	—	—	×	×	×	×	×	—	—	—	—	—
14.....	—	—	×	—	—	—	—	×	—	×	—	—
15.....	×	—	×	—	—	—	×	×	—	—	—	—

slow in comprehension. The latter comes through confidently in the end.

The three pupils who have mastered are now released from assimilation for voluntary project work or work in other subjects, and the teacher proceeds to further assimilation with the remainder of the class. The test has been revealing in its nature and, as he reflects, he notes several points which can be cleared up by explanation, notes that some pupils are not strong in intensive reading, and that save for the three released, all need further assimilative experience. It should be noted that his redirection of assimilation is critical. No corrective teaching is otherwise done.

Simply to tell the pupils to read some more or to work some more exercises is largely to waste time and set up a cramming attitude.

After a day or two of further assimilation, or perhaps longer, a similar test is given. The results are disclosed in Table VII.

The class as a whole has evidently mastered. The teacher has still some doubt concerning Pupils 5 and 6, but he notes that both had revealed substantial progress on the previous test, his *rapport* testing had given him considerable confidence in their learning, and he observes that both failed on the same question. A

TABLE VII
ASSIMILATION TEST RESULTS II

Pupil	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1.....	—	—	—	—	—	—	—	—	—	—	—	—
2.....	—	—	—	—	—	—	—	—	—	—	—	—
4.....	—	—	—	—	—	—	—	—	—	—	—	—
5.....	—	—	—	—	—	—	—	—	—	X	—	—
6.....	—	—	—	—	—	—	—	—	—	X	—	—
9.....	X	X	X	X	X	X	X	X	X	X	X	X
10.....	—	—	—	—	—	—	—	—	—	—	—	—
11.....	X	—	X	X	—	X	X	X	X	X	X	—
12.....	—	—	—	—	—	—	—	—	—	—	—	—
13.....	—	—	—	—	—	—	—	—	—	—	—	—
14.....	—	—	—	—	—	—	—	—	—	—	—	—
15.....	—	—	—	—	—	—	—	—	—	—	—	—

brief individual conference reveals the fact that both had failed to catch the import of this question, and that the pupils have, in fact, a clear understanding. Pupils 9 and 11 are evidently clear problem cases, and they are set aside for remedial study and teaching. Except for them, the teacher has good ground for judging that assimilation is complete.

Now the unit test might quite as validly have been conducted by extended individual oral cross-examination. The objections are purely practical, in that the process would require too much time if it were thoroughly done and in that it would be difficult for most teachers, without training in the art of cross-examination, to frame oral questions as skilfully as is possible in the case of the written test.

MISCONCEPTIONS.—The inclination of some teachers who are new to mastery teaching, and in whom the preconceptions of the passing grade are still strong, is to select arbitrarily a passing score, let us say 10 or 11 when the full score is 12, and adjudge mastery for all pupils who attain such a passing score. The effect has all the bad implications which attach to the passing grade elsewhere and which we have discussed in chapter iii. A full score on the unit test is good presumptive evidence of mastery, better in proportion as the test is well devised. At any rate, it is the best evidence we can secure. But a lower score, when a pupil reacts correctly to the greater part of the questions with none wrong is nearly as good evidence as a full score. In general, if a pupil fails on only one question, there is good ground for further inquiry. If the test results show numerous “wrongs” on the same question and the teacher detects wherein the question was a misfire, the corresponding scores can be eliminated and the results considered apart from those of the faulty question. Hence it is always well to have a list of test questions sufficiently long to make it possible to eliminate one or more and still keep a good test. Judgment is in the light of all the evidence, only the teacher must be faithful to the evidence. It will not do to conclude, in the face of very inconclusive evidence from the test, “Oh, well, I just know that A, B, and C understand, so we will pass on.”

NEGATIVE AND POSITIVE EVIDENCE.—A test of this sort will yield a great deal of negative evidence, that is, no evidence that the pupil has mastered, as well as positive evidence that he has not mastered. Hence, it may often happen that the pupil is turned back for further assimilation when in fact he has mastered. As in the somewhat similar case of re-presentation, we cannot be too sure of mastery. In the long run these pupils profit. The chief consideration which needs to be borne in mind is the possibility that emotional problems in the form of resentment will thus be set up in them. If, however, the notion of educational rivalry and appraisal by rank-in-class has been pretty well stamped out, this danger will be minimized.

TEST MATERIAL.—While skilfully devised test questions focused on the several elements of the unit and upon the unit as such will serve the essential purpose of testing, the test material furnishes somewhat the same opportunity for progressive scientific development of the structure of the unit for teaching purposes as does the guide sheet. A fully developed guide sheet is the result of an exhaustive survey of the application of the unit in type situations and of the formulation of problems in large numbers to cover such type situations.

Similarly, the process of developing the best critical test questions is a matter of utilizing the type situations found and formulating test questions which are derived from such applications. The test material thus parallels the guide sheet.

The process of formulating the best problems for the guide sheet and the best test questions is far from being an off-hand enterprise, and I doubt that either the best guide sheet or the best body of test material can be developed apart from prolonged study of the materials of instruction and classroom experimentation.

For the accumulation of a body of test material, the card catalogue device is suggested. Whenever a promising question is found, it is written out on a card and the card is filed. Whenever one of these questions is used and is found to be defective, it is removed and a better is substituted. The teacher thus accumulates an extensive stock of such questions, the utility of which has been tried and tested.

PERVERTED USE OF TESTS.—Since the first edition was published, I have sometimes noted a tendency in the use of the systematic teaching procedure in the science type which goes far to invalidate whatever good results might otherwise have accrued. In such instances, pupils are allowed to take an attitude that the testing is a process of surmounting obstacles and that they will be allowed to take tests until they "pass," with little or no regard to further study and learning effort and without the conviction of ignorance which ought to be the disclosure of the test. Of course

this is only another illustration of the carry-over of the performance stereotype. Viewed from the teaching angle, it discloses failure of *rappport* testing. When the pupil approaches with the plea, "Oh, Mr. ———, can't I try it again; I just know I can pass," the rejoinder ought to be, "I don't know whether you can pass or not, but I do know that you have not yet learned and I shall not let you try again until I think you have learned." And then of course the pupil will be tested with a different list of test questions.

Testing is a part of the teaching process. Just as no system of technique and no method will take the place of the teacher's insight, acumen, diligence, and fidelity to professional duty, in exploration, presentation, and the supervision of study, so will effective testing depend upon the same qualities.

CHAPTER XVI

ORGANIZATION AND RECITATION

IT IS during the period of assimilation that the greatest scattering of pupils in progress toward mastery takes place. The class is brought together for organization. During the assimilation period without corrective teaching, if we could measure accurately and precisely differences in progress, the class would probably be found to distribute itself much in accordance with the normal distribution surface, for a multitude of chance factors are at work in determining the rate at which learning takes place. No such precise measurement is, however, available, and it would be of little service if it could be found. What is actually found toward the end of assimilation, in a school which has become accustomed to mastery teaching and fairly successful in its application, is a situation somewhat like the following.

SPREAD DURING ASSIMILATION.—A comparatively small group of pupils, but one which becomes constantly larger, has been released for some time for work on voluntary projects or similar enterprises. The length of such release varies a great deal, the progress made on the several projects also varies, and the number of such projects accomplished during the course varies. Generally speaking, most projects which are really worth while are worked upon over the release periods of several units and in the pupil's unassigned time as well.

The bulk of the class varies but little in its progress during assimilation. The teacher is somewhat more confident of mastery in some than in others, some have gone back for restudy more than have others, but in general they arrive at the end of assimilation at about the same time. By carefully testing the rate of progress without corrective teaching, Beauchamp found that pupils in this group would keep nearly together over a period of

several weeks. A given pupil would forge ahead for a few days and then give place to another. If corrective teaching had been done, some of the relatively slow workers would have been synchronized with the relatively rapid workers and the spread within the group contracted. The corrective work on the two girls in sustained application reported in chapter ix (see page 150) is a case in point.

A third group is composed of the problem cases. The corrective cases have perhaps had considerable teaching out of class, and the remedial cases have been assigned to other sections or remedial classes. In either case, most slow or problem-case pupils who are allowed to take the organization at all reach that point with the second of the three groups. Nevertheless, all the foregoing depends upon faithful and effective attention to the numerous details of procedure explained in the preceding chapters and in Part IV. Left to themselves in a new kind of lesson-hearing, the pupils will scatter in rate of learning almost indefinitely.

RAPID LEARNERS.—The question will doubtless suggest itself, Why not let each pupil take the organization as he comes to it and then let him pass on to the next unit and eventually to the next course? There are several good reasons to the contrary.

Such a procedure simply results in a breakneck race through the school in which performance is exalted to the place of education. The notion of school work as being simply a series of tasks to be performed and belief in the brilliant student as the one who accomplishes such tasks most rapidly are both raised to the pinnacle of educational absurdity. Such pupils arrive at the graduation point possessed of little but skill in accomplishing school work, infant prodigies who are promoted to higher institutions without the proper products of normal educational growth. Therein they come in contact with people who belong to an entirely different level of social maturity, and the result is liable to be an unhappy one. It may be disastrous in the extreme. No op-

portunity is afforded them for discovering and developing genuine interests and solid self-dependence. An individual who might have become a leader, of genuine and useful devotion to the intellectual way of life, tends to become merely an arrogant and conceited exhibitionist in a world which ever accords a singular admiration to mere brilliancy.

Per contra, such pupils are now and then released from a unit or from a course when the evidence points to the principle that they have in fact acquired the learning which the unit or the course implies, but they are released in order that they may devote themselves to other studies upon which their time can more profitably be spent. Such other studies are not necessarily accumulated as credits for earlier graduation, although even so the evidence touching the individual may be such that early graduation is seen to be the best thing for him.

Recitation is an eminently essential member of the learning and teaching cycle, and one of the essential features of recitation is its social character. It is worthless without an audience, and the class group is the appropriate audience. Furthermore, if the learning process as applied to the unit has been successful in the best sense, the recitation will disclose many different points of view touching the bearing and significance of the unit, all of them correct and all of them helpful. The rapid learner not only should contribute his point of view, which is likely to be valuable because of his extended study, but he should come into an attitude in which he can learn from others who are less brilliant but who have nevertheless somewhat to contribute. Organization is essential to recitation. The pupil who has been pursuing his own interests for a week, or perhaps several weeks, is inevitably more or less out of touch with the sequences of thought contained in his earlier study. Hence, it is helpful to him to come back into the main stream of the unit before the recitation period. Accordingly, organization is better attached to recitation than to assimilation.

I

ORGANIZATION

When the teacher is convinced that assimilation has taken place in the class as a whole, organization is announced. For this purpose the class assembles without books, notes, charts, or any other helps. Their problem is now to gather up the argument of the unit in outline form, with the essential supporting facts. Once more, the organization is focused upon the central understanding and not upon the assimilative material. Hence in form it is the outline of a coherent and logical argument and not merely an exhibit of facts.

FORM.—The outline may take the form of a syllabus with the main headings which carry the argument, the subordinate headings, and the appropriate subheadings; or it may be an outline in the systematic form of brief topic sentences. In either case, the class must be taught how to make the outline, especially in a school in which such teaching is new. Once the pupils have caught the idea, however, they will organize very passably well and improve as time goes on.

The notion of organization can be developed in the early grades, certainly the fourth. The essential difference between the organizations of the young children and those of high-school pupils seems to be found in the principle that the young children's organization contains only the main heads of the argument while that of older pupils develops the subheads. Pupils in the senior high school will often produce very lengthy syllabi running to several pages of paper. Indeed, there comes a time when the older pupil needs to be trained out of a tendency to prolixity.

In starting the younger children to organizing, the chief dependence can be placed upon leading questions. Instruction is somewhat after the following fashion.

"We have been studying about —— for a long time, and now we want to bring the main points that we have come to understand together in a framework.

"You sometimes see in the first part of a book what is called a table of contents. Here is an illustration [exhibits]. We are going to make tables of contents for what we have studied.

"Now, at first I am going to ask some questions, the answers to which you all know, and the answers will be the main heads of our organization."

After a time the questions are omitted, and the training in organization proceeds in this way:

"What is the first big point we have learned? Why, it is this, is it not [writes]?"

"And the second is this [writes]," and so on.

In the fifth or sixth grade, the children should begin to make their own organizations. Of course, the early organizations will be very far from perfect. Irrelevant heads will be brought in, and some of the children will make no serious effort to organize.

TRAINING.—On each organization, the process of training is much like that used in intensive reading. Several of the papers are taken up and discussed. This point has nothing to do with the matter; this one has. The paper is a good organization, because as you read the points there comes into mind the meat of the argument. Every point that John has made has a definite bearing, while this point and this point on James's paper have nothing to do with the story. There will be some pupils who do nothing at all, and it is by no means easy to distinguish between those who have failed to catch the notion and those who have simply made no effort. In general, the latter will be in the majority. These people are simply told that they will keep on trying, after school if need be, until they produce something which is acceptable, and at least an evidence of effort. After this period of reteaching, the papers are turned back for perhaps a single second attempt.

Now there is no mastery involved in organization. It is a matter of performance and growth, and from unit to unit only what is judged to be the pupil's best effort is accepted. As the pupil progresses into the junior-high-school, the process of definite

instruction is minimized and the pupil is left to organize the unit in his own way, only the inadequate papers and those which the teacher thinks the pupil is capable of improving being turned back for further effort.

Needless to say, uniformity in organization is neither necessary nor desirable. Individual pupils will see the argument in somewhat different lines, and this individuality is to be encouraged rather than suppressed.

IN MATHEMATICS AND GRAMMAR.—Such is the organization in subjects of extensive content. In arithmetic and grammar and the mathematics of the high school taught as purely a logical subject, no organization of this sort is practicable or necessary. The class goes from assimilation directly into recitation. When mathematics is taught as a content subject, however (see chapter xiii, p. 245), the same procedure is used which applies to physics or history.

The organization is not primarily a unit test, but a part of the learning process. The element of performance is too large for reliability as clear evidence of understanding. None the less, it, like every other part of the pupil's performance in learning, is full of revelations touching the organization of the course, the technique employed, and the pupil himself. We cannot use failure in organization as evidence of non-mastery in opposition to the evidence of the assimilation tests, but we can draw conclusions touching the guidance of individual pupils and the teaching of subsequent units.

The organization is as fundamental to the pupil's training in English composition as is the recitation. The English Department in the University High School is clear that no single step in the school career has accomplished more in the direction of composition training than has the organization in the science-type subjects. The final step in the mastery of any understanding is taken when we "write ourselves clear-headed" about it. Then it is that previously unnoted haziness makes itself baldly evident, and we become conscious that the understanding is our

own and not merely lip-service to another. The first step in gaining such intellectual clarity is the logical arrangement of the ideas which constitute our understanding.

II

RECITATION

The organization requires perhaps two class periods, seldom more, and often only one. When the teacher has become satisfied with performance at that stage, the class meets for two or three days for recitation.

PROCEDURE.—The recitation is to all intents and purposes the reverse of presentation. In the latter, the teacher presents the unit to the class; in the former, pupils who have mastered the unit present it, the class and teacher sitting as an audience. It bears no likeness to the daily recitation. In the daily recitation on the prepared lesson, the pupil has at the best only a meager account which he has culled out of the book. In most cases he has only a scrappy collection of details his control of which is uncertain, and his delivery of which is helped out and bolstered up by the teacher's leading questions. In the mastery recitation, the pupil has something of a coherent nature to present, he knows what he is talking about, and at the best he is quite capable of delivering an interesting lecture running to thirty minutes or more. At the worst, he can at least stand on his feet and say something which is pertinent to the learning product mastered. The daily recitation is primarily a test; the mastery recitation is primarily a part of the learning process.

At the end of organization, the teacher states that the next two or three days will be taken for recitation. He announces that Mary, Clara, Mabel, Richard, and Donald will deliver the "floor talks" on this unit. Perhaps he can include eight or ten pupils instead of five. Before the next class meeting, each of the pupils named arranges his recitation, decides what line he will take, and perhaps prepares notes for assistance on the floor. If it is a science class, he may spend some time in the classroom ar-

ranging apparatus which he wishes to use. If the recitation is to be in social science, he places upon the board the data to which he expects to refer.

When the class assembles for recitation, the teacher seats himself among the pupils and the pupils who recite take successively the teacher's position. In other words, an audience situation is created. The pupil who has the floor proceeds much as the teacher proceeds in presentation. He uses the blackboard when he needs to, uses demonstration apparatus if that will help to make his points clearer. He holds his audience because he is conscious of endeavoring to convince them that his view of the matter is a sound one or of trying to interest them in his presentation. Interruption, either by the teacher or by a member of the class, is viewed as discourtesy, and it is not allowed, unless the pupil himself has said that he will be glad to be interrupted for questions.

At the close of the pupil's recitation, there is apt to be a period of questions and discussion and contributions in which members of the class will take part. This period should be kept perfectly natural and untrammelled by the teacher, except as far as it may be necessary to keep order and due courtesy and to prevent rambling. Especially should the teacher avoid that set order in which the pupils are asked to "criticize." Such comment as may be called for touching the improvement of the recitation technique should be made definitely, clearly, and convincingly by the teacher. Perhaps there will be time enough in the ordinary high-school class period for two or three such recitations. In the elementary school they will be shorter and there will be time for more of them, even in the short elementary-school period.

The floor talk thus described is of course recitation at the best. It is not ideal, if by "ideal" is meant the unattainable. The author has heard many recitations of which the foregoing is an inadequate rather than an overdrawn description. Both in the laboratory schools and elsewhere, he has not infrequently sat through a pupil recitation, the interest and charm of which made him for-

getful of his primary purpose of supervision and critical observation. Such are of course the exception, but the ratio which they bear to very poor recitations constantly improves under skilful and faithful teaching.

NOT A TEST.—The recitation, like the organization, is performance and not mastery. It is not a time for grading and evaluating pupil achievement. A pupil who presents a superior recitation thereby evinces no evidence of mastery of the unit, which is necessarily better evidence than that shown by the pupil who is semi-articulate. The mastery evidence is settled in the assimilation test, so far as the individual pupil and the present unit are concerned. The pupil who produces a superior recitation shows that in one way at least he can make a better use of mastery than his less capable classmate, and that is a useful thing to know as a part of his case history. Learning is applied to mastery of the unit and not to proficiency in recitation. Nevertheless, steady performance improvement in recitation is desirable for two reasons.

In the first place, superior performance in the recitation period undoubtedly makes for clarification of the learning achieved. In that sense it is a sort of supplementary study tool.

TRAINING IN PUBLIC SPEAKING.—In the second place, ability to stand before an audience, think on one's feet, and speak convincingly is in itself an eminently desirable learning product. Continuous training in the natural situations created by the recitation period over a long series of units and succession of courses is bound to be much more fundamental and effective, other things being equal, than practice in the artificial situations available in a brief course in public speaking.

With the purpose and function of the recitation period already in mind, the pupil will himself formulate an effective process of training. The following suggestions based upon experience are, however, offered.

In the first place, if the natural volubility of children in the primary period is not suppressed beyond what is necessary for

the development of the primary social adaptations, one great asset is secured from the beginning. The ancient precept which holds that children should be seen and not heard is undoubtedly largely responsible for the development of a body of inhibitions which produces the inarticulateness which is so typical of children in schoolroom situations. The child who is extremely articulate on the playground becomes dumb in the artificial and needless restraint of the classroom.

In his oral recitation the pupil should not constantly be made conscious of the manner of his speech. Like all the rest of us, if he has constantly in mind how he is expected to speak, he will say little. If the teacher sets a good model in presentation, from time to time talks to the class before the recitation period, showing them how the floor talks can be improved, and then exercises patience, the pupils will all tend to improve from year to year. In the later years of the senior high school, it is easy to note a marked contrast between pupils who have had practice in oral recitation throughout their high-school careers and those who have not had such practice.

The recitation critically observed is a good index of the character of the long period of study upon the unit, not a mastery test but a revelation of the coloring of the pupil's adaptation. If study has been largely formalistic, without interest or enthusiasm or inward conviction and enlightenment, then the pupils may react properly to the assimilation tests and yet reveal a colorless and meager recitation. Such a disclosure is not a reason for reteaching the unit, but it is an admonition to modify and enliven the conduct of the next and succeeding units.

Sometimes it is worth while to try a series of floor talks over again in the following manner.

A certain recitation observed by the writer was passably good, but neither teacher nor class was satisfied. Toward the end of the period the teacher interrupted the class and something like the following took place:

"I don't think any of us are satisfied. It seems to me that these people can talk much better than this. What they have said to us is far from convincing.

"They are too much concerned with how they appear when they stand up before the class and how they are going to speak. The result is that they have little to say and that is confused and rambling. It sounds like an old-fashioned daily recitation.

"Now prepare yourself this way:

"Have definitely in mind that your job is to convince the class that such and such is the way to look at this unit. You have about four or five points which you wish to make. When you stand up before the class, have those points definitely in mind. What you are going to say will come to you all right and how you are going to say it.

"Talk to the class and hold the class attention. If Fred over there doesn't seem interested, talk directly at him for a minute and you will see what happens. Today, you all looked at me as if you were trying to satisfy me. I am satisfied already that you know the unit. I want you to get your own message across to the class. You had a good point, Mary, when you called attention to ———. That was your own, but you talked to me as if you weren't quite sure and were wondering what I would say about it. Never mind me, talk to the class. Especially talk to James and Arthur, who are rather skeptical. Let's try it again tomorrow."

The following day, the writer again visited the class and heard a beautifully complete series of talks addressed to an interested class, a useful and effective piece of public speaking applied to the argument of a unit in chemistry.

ON THE UNIT.—The recitation, like all the preceding steps, should be focused upon the unit as a piece of understanding and not upon the content of the assimilative material. Here, as elsewhere, when the unit is in the foreground of consciousness, the needful bits of content drop into place almost automatically. Very often, however, the pupil will offer a floor talk which is

merely a resumé of what he can remember of the assimilative material. Instead of using selections from the latter to fortify and defend his argument, he merely recounts items without reference to argument. Of course this is merely a good daily-recitation type of talk. Patient instruction, after the nature of that used in the illustration, will soon produce improvement. We encounter many students in college, not to say in high school, who have never in their lives had a glimpse of what the exposition in school of a piece of understanding which is their own property really means. The organization and recitation constitute the supreme opportunity for the communication of such a vision.

ROTATION.—It would obviously be desirable to give every pupil an opportunity for a floor talk on every unit. This is impracticable; first, because there is not time enough; and, second, because the class would often become very much bored. On the last point, however, good recitations are not in fact wearisome. The writer has seen a class in physics listen attentively to sixteen in succession running over two days of double periods with an intermission of ten minutes between the two halves of the period on each day. Something may be said in favor of the need of training young Americans into habits of prolonged attention in the listening attitude and out of the self-indulgence which requires mental titillation from moment to moment. Nevertheless, from five to perhaps eight floor talks on a unit are usually all that is practicable in the senior high school. In subjects in which the content is less extensive, and in the elementary school and junior high school as we have seen, more can be had. To meet the need in part, the pupils present their floor talks in rotation on the successive units, while those who are not assigned floor talks present written papers on the unit.

It is of course desirable that the floor talks should deal with the unit as a whole, as did the presentation, but this is not always practicable. There are two serviceable variations.

VARIATION IN TREATMENT.—In the first place, many units can be treated in their applications in such a manner that each

application is in effect an exposition of the unit. The long physics recitation noted above, was handled in the following manner:

The unit was "Lenses." There was available a cycle of applications: the microscope, the telescope, the camera, the stereopticon, and the human eye. Each pupil chose the application which he preferred and developed from it the theory of lenses. A large model of the eye was available, a camera and a stereopticon, and these the pupils used. The other two applications were demonstrated from board sketches made as the pupils talked.

III

THE WRITTEN RECITATION.—The written paper serves the purposes of the reaction member of the learning cycle as well as does the oral recitation—perhaps better—but it gives a different kind of training. At the beginning of the recitation period, the class knows who are selected for floor talks on the unit, and the others are free to begin their written papers, preferably out of class time.

Now much depends upon the pupil's attitude toward and his conception of the written paper. If he looks upon it simply as a task to be performed with the minimum of effort which will satisfy the teacher, then the writing will serve no useful educational purpose. "Just another paper for ——" is not worth writing. Hence, the pupils should be indoctrinated with the notion that they are writing papers designed to enlighten and convince others. The devices which the teacher uses for the establishment of this attitude are of course many, and they will depend for their effectiveness upon the teacher's clear perception of the purpose which the paper is intended to serve and upon his ingenuity and resourcefulness. In the elementary school, and often upward into the college, a typical device is to have the pupils throw the paper into the form of a letter. Another device useful in the senior high school and college, and often earlier, is to say to certain pupils, "I wish you to write this paper as an article for a technical magazine or as a chapter in a book."

The written paper should be utilized as an opportunity for English composition. Instead of being allowed to dash off a paper in the interval between other appointments, the pupils should be convinced that the preparation of a paper is entitled to a great deal of laborious effort. It is well, first, to write the paper out rapidly with an eye in the main to organization. Then the work is gone over carefully for treatment. This point is elaborated somewhat. That passage is repetitious of something which has been said before and may be eliminated. The reader will not understand this paragraph; it must be recast. Next, the whole paper is examined critically for use of words. Here is a word which does not mean what it is intended to mean. Here is a personal pronoun which does not agree with its antecedent. Here are inconsistent uses of tense. The paper is then copied and finally proofed for bad spelling, bad punctuation, and the like. The pupil should be taught to keep a simple and helpful manual of English usage at hand for his own guidance.¹

Every paper which shows evidence of this kind of effort should be accepted, however imperfect it may be, except upon one issue. The pupil must apply the common usage which he has learned. If the paper appears in slovenly handwriting when the record shows that the pupil is capable of writing a legible hand, if he repeatedly misspells "separate," "occasion," "their" and the like, and if he runs sentences together or makes lavish use of an introductory "and," then the paper should invariably be turned back with the appropriate comment.

On the other hand, every paper which shows evidence of hasty preparation, which is in effect simply in examination-paper form, should likewise be turned back with patient and firm admonitions which convince the pupil that effortless papers will simply

¹ There are of course many such manuals. A very serviceable one in pamphlet form originally prepared for pupils in the University High School can be had through the University of Chicago Bookstore. The title is *Standard Usage in English*. The essential point is that pupils should become accustomed to preparing papers, whenever they have writing to do, with the care which the educated person uses and that they should be trained in the use of the tools which writers employ.

not be accepted and that the categorical imperative is in full working order.

This implies a great deal of paper work on the part of the teacher? Assuredly it does, and that is a vital part of the teaching process. It is not merely a question of training in English composition; it is also a question of the thorough teaching of physics or chemistry or economics or history.

IV

SIZE OF CLASS IN SCIENCE TYPE

Mastery teaching as applied to subjects in the science type presumes small classes? It does, indeed. The size of classes at the level of the university, when students have ceased to require constant and intimate contact with the teacher, when they have learned how to study and have definitely matured plans for study, is limited only by the size of lecture-rooms. But even in the higher ranges of university study, the number of students whom a single professor can guide in their research is limited by the number whom he can intimately know and follow. In the secondary period, however, the teacher must be able to know the individual at every step. In the science type especially, the exploration requires that the teacher shall be able to form a just impression of the intellectual background of every pupil. In presentation, he must be able to sense from the presentation test papers whether or not every pupil has caught the central thought of the unit. In supervised study, he must be able to come intimately in contact with the methods which each pupil employs and the learning problems which each presents. In the written recitation, he must be able to read thoughtfully and critically the papers of perhaps three-fourths of the class on every unit, and many of them two or three times.

And this is not all. The teacher must meet several classes each day, and that means several groups of individuals. There must not be so many that the teacher cannot know well each in-

dividual who is under his instruction for the year. Furthermore, something must be said of the size of the school itself. The teacher meets his classes of individuals for a semester or a year. If he meets the same pupils in several other courses during their years in school, and gets to know them well in their extra-curriculum activities in the intervals between courses, his potential effect upon them is immeasurably increased. When the school is so large that a given teacher is obliged to remark in staff meeting, "I think I had that boy in a course during his first year," the possible educational effect of the school upon the pupil is too obvious to require comment.

What, then, is the limit of class size imposed by the requirements of the science type? If precise answer is required, we have none. Obviously, some teachers can effectively teach more than others, and the same teacher can effectively handle a larger number in one course in the science type than is possible in another. In general, we find empirically that classes up to thirty can be managed without serious difficulty. We have noted no serious difficulty when the teacher meets ninety to one hundred different pupils daily in a school of five hundred. We think the school might be expanded 50 per cent on a five-year basis and still avoid submerging the individual under a system of tests and measurements without intimate personal contact. On the basis of five hundred pupils, it is to be noted that not all the teachers in science-type subjects become acquainted with all the children in school, but most of the teachers do become acquainted with most of the children. On the other hand, we have tried experimentally to have elementary teachers meet two hundred children daily in courses within the same year, and we know as a result that it cannot be done if the teacher is to know the pupil well enough to guide his educational growth. Per contra, it should be said that a school which handles its program on a daily-lesson basis, with appraisal of pupil progress by teacher's estimates based upon performance and not upon learning, or else by standardized performance tests in which a median performance is mistaken for

a learning product, should be able to handle one size of class and of school about as well as another.

We have devoted a great deal of space to the science type, more than will fall to the lot of any other, and the fact has a certain significance. In the first place, many of the principles set forth will find a place in succeeding types. But more than that, the subject matter which falls under this type constitutes the content of a major part of that adjustment of the individual to environment which is education. If we include the practical arts as an offshoot and corollary of the science type, there is found in the broad field thus covered all the adaptations which constitute the stock of the individual's intelligent and reasoned attitudes toward his physical, biological, and social world. He has still to acquire those adaptations which are not reasoned but felt, and to this field we turn in our discussion of the appreciation type.

CHAPTER XVII

THE APPRECIATION TYPE

IN OUR long consideration of the learning products which we identify as essentially attitudes of intelligence or reasoned convictions, we have been dealing with a field which is in large measure the outcome of a very recent period in the evolution of civilization. Prior to the rise of modern science, this area was not readily open to educational use, simply because neither a scientific method of thinking nor the disclosures thereof had yet appeared. In sharp contrast, we now turn to a field of adjustments which have been slowly worked out in the long racial quest for happiness and peace of soul and in the pursuit of the art of living together in society. Man has sought the good, the beautiful, and the true and in large measure he has found them and is still finding them. He has found them in nature, and in that which he conceives to be above nature; and he has handed them down to his posterity in music, in the pictorial and plastic arts, in literature, and in that code of personal obligations which he calls honor and religion. Herein we find the second of the fundamental types of adjustment to his present world, and to that ideal world which man forever seeks, which education leads the child of the race to make.

“In the science type we dealt with understandings; in the appreciation type we deal with values. Here we reach the bed rock of life. It is what men value that stamps their characters and molds their conduct. On the whole people do what they like; experience shows that they often know this to be wrong; and the inevitable educational inference is that the most basic task of home or school is to make them like, or value, what is good.”¹

¹ This passage quoted from Ruth Mary Weeks perhaps states the contrast as accurately and trenchantly as is possible.

I

NATURE OF THE LEARNING PRODUCT.—The learning product attached to any particular value is a simple recognition of worth. "Appreciation" means "putting a value to." It is not the outcome of any reasoning process whatever; it is not a reasoned conviction. This is perhaps the real ground on which the church has in all the ages feared rationalism as applied to spiritual things. Unhappily, the church has often also feared rationalism as applied to things which are not spiritual. The young person in the present age of science is prone to find it hard to accept the principle. He is natively inclined to ask "Why" and he easily carries his *hypertrophied scientific attitude* over into fields which belong to an utterly different kingdom of human culture. He asks to be told why the Parthenon or a Beethoven symphony is beautiful, why obedience to the law is right, why honest craftsmanship is to be preferred to lazy and slovenly work, and so on. As a student in college he comes under the influence of instructors as untrained and lacking in discipline as himself and ends by asking why marriage is necessary and why honor is more than a system of tabus set up in support of the self-interest of a ruling caste. An elaborate degenerate literature has grown to feed his misconceptions. Turned into school as a teacher, he attempts to develop appreciations by explaining why, and he never succeeds.

It is quite true that psychology can frame theories which explain how it is that we form certain appreciations. Some such theories rest on convincing bodies of fact and principle; most of them scarcely rise to the level of respectable conjecture. All such appreciations existed long before there was such a science as psychology and they are no more likely to rise in the personalities of the psychologists than in those of other people. Explaining the thing is not the thing itself.

We may consider a particular lyric as the consequence of the poet's unusual diet or his unusual lady, and neither explanation will exclude the other. The beauty of the lyric itself, as much as the beauty of a rose sprung from a refuse heap, is quite independent of its origin. . . .

Though science originated in myth, it does not follow that contemporary science is mythical. If religion developed from ghost-worship, modern religion is not therefore nothing but a modification of belief in ghosts.²

Incidentally it may be remarked that some "literary" efforts in this and in other ages seem to be valued not because they are felt to be either beautiful or true, but because they did spring from muck-heaps.

In tests of aesthetic judgment a common procedure is to exhibit before the pupil three pairs of women's heads. In each pair a comely face is contrasted with one which is inexpressibly ugly. Normal six-year-olds make the correct choice. Fifty per cent of the five-year-olds fail to appreciate the difference. Assuredly these children's judgments are not a matter of reasoned analysis. The six-year-old has sufficient experience to enable him to judge and his judgments conform to the judgments of adults.

And so it goes. Our likes and dislikes have nothing to do with reflective thinking, and still less to do with the fundamental values of life. The standards which have come down to us are the result of untold centuries of social experimentation. The true values have survived and become standard because they are the values which have been capable of constituting civilization. In the long run, a culture upon which civilization can be based survives a culture under which civilization is inferior or impossible. In this age of persistent research and scholarly evaluation, we have in our hands a record of the evolution of society which, though it is far from being complete, is nevertheless illuminating and convincing. It appears to be clear that just as organic life has evolved from lower forms so the values which hold society together today have developed out of forms which served their purpose in holding together much more primitive societies.

We may push the analogy farther. Many forms of life have appeared in the organic series which had in them no possibility

² Quoted from *An Introduction to Reflective Thinking*, Columbia Associates in Philosophy, p. 179.

of further development and so they are now substantially what they were in the Palaeozoic era. Innumerable other grotesque forms once developed which were never capable of survival in a constantly changing environment and so they have long since been eliminated in the ruthless march of progress. On the other hand, the biological ancestry of man as far back as we care to go contains little or nothing which was not inherently capable of evolution into higher and higher forms. And so with the culture forms. The horrible religions of Levantine antiquity, for instance, based not merely on man's animal impulses but on proclivities which few of the lower animals exhibit, had their brief day and perished carrying the art and literature and conduct in which they were embedded along with them into the pit. One of the greatest of the spiritual world religions had the same local origin and is still the principal factor in western civilization.

There is not a piece of literature produced today, at least none in which we can have any reasonable confidence, which in its structure does not go back through a long process of racial learning—through our own immediate cultural inheritance, through the Greek and western Asiatic until the story becomes lost in pre-history.

In art, the most universally accepted forms go back through the Renaissance, the Gothic and Norman periods, Rome and Greece, into ancient Egypt and beyond. It is not too much to say that some of the essential features of American office buildings are found in Egyptian temples.

In morals, the Hebraic Decalogue is as valid today as ever. It is not enough for modern civilization, but the differences are in the direction of additions in the spirit of the ancient law and not in the direction of subtractions.

Now it is very impressive to see how attempts to cast loose from the historic stream entirely almost always land the creators in primitive forms which have long since been left behind. Music easily falls back to the level of the tom-tom of the jungle, probably because the people who like that kind are still at the jungle

level. Degenerate literature inevitably shows the characteristics of some of the Levantine religions. Various modernistic art forms—of course those which we have in mind are not modern but only degenerate—can be shown to be much like the figurines of the Congo. "Freedom from tabus" in conduct usually reproduces the conduct of the peoples for whom tabus were invented. All very much as babies are occasionally born with rudimentary tails or gill slits or with the cranial development of Pithecanthropus.

Devotion to evolutionary methods of thinking has not infrequently led people into queer logic. One such instance is the notion of relative morality—or relative standards of any sort. The historical maxim which holds that we must not judge people of past ages or other lands by our own standards, if we have in mind imputing credit or blameworthiness, is of course sound. If for instance we are inclined to become scornful of Elizabethans for their coarseness in social intercourse, we indulge in a historical fallacy. But that is not to say that the standards themselves represented so high a type of civilization as do our own. To adopt such coarseness as was habitual with the Elizabethans because the Elizabethan Age also produced Shakespeare is also a historical fallacy. To hold that standards of womanliness which prevailed in Athens in the fifth century B.C. were right because they were universally accepted by the Athenians, is like holding that we ought to go back to their medical science because neither Plato or Aristotle knew anything about the mechanisms of the endocrine glands. The standards of primitive men or of any of the past historic ages were no more right for them than they would be for us. Their false value attitudes crippled their civilization just as our failures cripple ours. We have by most tests a more beneficent civilization because we have learned a better set of values.

II

THE APPRECIATION TYPE IN EDUCATION.—Jurists tell us that conduct has in general three controls: positive law, moral char-

acter, and free choice. Living under civilization is largely a matter of doing as we please so long as we do not interfere with the equal right of others to do as they please. Or, to put it another way, civilization consists in each person living his own life to the extent that doing so does not prevent another person doing the same. Life itself becomes intolerable when unruly and lawless people can have their own way. Hence a characteristic of all civilized nations is what is called positive law, which is at bottom simply a social institution which compels uncivilized members of the community to be decent. The good citizen is simply a civilized man or woman, although he or she may possess culture far beyond the requirements of civilization. The good citizen needs no law because he appreciates the right and is willing to do right. His values are the values of an advanced, albeit imperfect, civilization. More than that, he appreciates obedience to law as such regardless of his own private conviction as to the need of a particular law.

Now, the number of laws in existence has always tended on the whole to be in inverse proportion to the dominance of standards of good individual taste and conduct. Many statute laws especially are perhaps unnecessary, but in the main multiplicity of such laws means that voluntary good conduct is not sufficiently general or not sufficiently adapted to the requirements of the time to allow people the pursuit of life, liberty and happiness without the protection of such laws; in other words, not enough people are civilized. In a country like ours in which society has come to rely on an extreme application of democratic control, even the laws themselves and their enforcement rest upon widespread popular intelligence and standards of good conduct. Positive law in a democracy always breaks down unless the proportion of really civilized people in the community is sufficient to set standards. Muddle-headed people often conclude that there should be neither standards nor laws.

Hence it is that the heart of the citizenship school, and that is the only kind of school for which the expenditure of tax money is

justifiable, is in the education which is administered through the studies and disciplines which belong to the appreciation type.

APPRECIATION-TYPE SUBJECTS.—The school subjects which belong to this type are especially conduct, religion, literature, music, and the pictorial and plastic arts. In the cases of the last three, of course we have reference to the impressional aspect. As a matter of expression, music is a language art and the other two are practical arts. To the objectives found in these fields may be added various others often found in connection with studies which belong also in other types. For instance, training in citizenship, so far as it implies civic obligation, connotes an objective in appreciation. So far as it implies intelligent attitudes, specific courses in social science are called for. The scientific attitude of mind, which we certainly associate with the study of the sciences, is nevertheless a specific objective of the appreciation type. A youth may study the sciences for years and acquire not only intelligent attitudes toward sundry aspects of the environment but a mass of erudition as well, and yet fail to achieve the sense of value which the scientific attitude as such implies. Again, he may achieve the latter as a working precept in physics or chemistry and utterly fail to realize that it applies to political action or educational administration. The attitude is a generalized ideal, and the student masters it as a product of appreciation or not at all. Again, interest which we associate with intellectual learnings is, in itself considered, a value attitude.

Clearly we indeed have here what are perhaps our most fundamental educational adjustments. In so far as civilization has progressed at all in terms of human well-being, its advance has been in the line of the satisfactions which the race, in its long process of trial and error, has found to lead to other satisfactions and not to doubtful experiences. So long as man found his satisfactions solely in the gratification of his primitive animal instincts, he rose little if at all above his kindred animals. As soon as a group began to seek the ideal, it became to that extent a social group; it survived and bred an expanding society based on

the pursuit of honor, or what it conceived to be honor, and of the satisfactions which differentiate man from the brute. Man began to express the soul that was in him in primitive music and drama and graphic representation. He developed a code which governed his relations with his fellow-man, calculated on the whole to substitute justice for the caprice of the strong. He became curious about his relation to life and built up some sort of religion which would satisfy his yearnings after the eternal. So have arisen through the long ages the wisdom of mankind and man's discrimination between right and wrong, and they have been recorded and saved in these appreciation-type fields which we cultivate in school. Every child tends more or less to revert to the life of his remote ancestors. He inherits their physical organism through the germ plasm. He inherits the culture of the intervening generations and of his immediate ancestors, only as it is communicated to him by the family, the school, and other social institutions.

Such appears to be the education of the individual in this field. As we educate individuals, we educate society, provided we can reach enough individuals.

SPECIAL REQUIREMENTS OF THE MODERN PERIOD.—The progress of science during the modern period, and the acceleration of that progress during the past half-century or less, has brought about an immense amelioration of the purely physical conditions of life. Perhaps its most significant effect in the United States has been a sudden rise in the economic power of great masses of people whose forebears knew little of existence beyond its story of daily toil and life-long penury. Not for them labor-saving machinery, the comfortable home, the automobile, the ready means of communication, the theater. But what are all these things for if not for the achievement of human satisfactions? The individual has found himself with a healthy body. He has avoided the misery of ill health in himself and family, but what shall he do with his good health? He earns more than enough to satisfy the pangs of hunger and to ward off the assaults of the elements.

What shall he do with his surplus? There is only one answer: He seeks satisfactions and, apart from the specific education required, he follows the line of his primitive instincts. Food-seeking becomes gluttony. Sex impulses become debauchery. Native love for surpassing one's fellows leads to a wild orgy of display. Posterity is robbed of its forest reserves in order to feed the printing press which titillates his untutored curiosity and discloses to him new fields of sensual gratification. Interesting and harmless animals are deprived of their skins in order that his women may wear them in the summer time and gratify the primitive instinct for emulous adornment. The bowels of the earth are recklessly despoiled of their reserves of mineral wealth in order that our barbarian may whip into life once more a nervous system which has been jaded and blunted in its capacity to respond to perpetual and abnormal stimulation.

This modern intellectual barbarian inevitably tries to justify his life. Since he can read and buy books, and has never acquired the taste which tells him what to read, he pays fabulous royalties to literary charlatans and pseudo-scientists who salve his embryonic conscience by explaining to him that he ought to gratify his passions and who furnish him with the media of sensual day-dreaming. When civilized people complain, the litterateur invokes the freedom of the press and the "scientist" blasphemes the spirit of Galileo by claiming kinship.

III

COURSES.—In few instances in the whole field of general education has the mechanical structure of the program of general education and of school administration, which has been extensively discussed and criticized in Part I of the present work, achieved such ridiculous outcomes as has been the case in studies which belong to the appreciation type. The way to learn a thing is to "take a course" and get "credit" for it. If the individual has received credit for a course in "character education," he must be

of good moral character. If he has had two courses, he must be twice as good, on the theory that life is altogether quantity. More than that, the way to pursue good character is to achieve passing grades on daily lessons in a textbook. Let us achieve "democracy in education" by allowing undisciplined and conceited pupils to discuss ethical problems which would stagger a class composed of Plato, Thomas Aquinas, and John Dewey.

However well meant courses in citizenship may be, they must of necessity prove more or less futile since the whole program of the secondary school plus that of the primary plus the effective family school will do well if it produces the good citizen. Not one but many courses in the social sciences, and the physical sciences as well, may contribute to the making of the intelligent citizen but unhappily intelligent citizens often cherish values which are not in keeping with their intelligence. Conversely, well-meaning citizens are sometimes bad citizens because they lack intelligence.

Courses in character education fall under the same misapprehension. The outcome of the whole process of education is the balanced and adjusted personality and that is only another term for character. Intellectual and volitional elements of character are fully as essential as moral elements.

Now if we catalogue all the good qualities which are characteristic of pieces of undeniably good literature or of the products of the fine arts or of examples of noble conduct, we shall have an imposing list indeed. If education consisted in learning what to do rather than in learning what to be, we might take the list and drill it into the pupils—if life should prove to be long enough. Such is not, however, at all the feasible objective and if it were feasible the result would be little more than regimentation in a series of precepts.

On the contrary, the values which rule conduct and constitute the inner resources of the educated person can be acquired in school only to a very limited extent indeed. It would be a shallow educational theory which should end by finding itself holding that

the ripe wisdom of sixty is but what was learned in school. What is acquired in school are the values which both make accessible and determine the preferences of a life-time. Hence pupils are not taught literature; they are taught to discriminate between the valuable and the tawdry. And so with music and the fine arts. We do not attempt to foresee all the conduct crises which the pupil may meet in life and prepare him to meet them, but we do attempt to train him and her in the major conduct attitudes which form the conduct structure of the civilized man and woman. The gentleman and the lady are much the same wherever we meet them in the world today. They are the true cosmopolitans. We can cherish considerable confidence that they would recognize their kind were they to meet their peers in the seventh century or in the twenty-fifth.

Hence there is but one course in literature or in the appreciation of music or in fine arts or in conduct, but it extends throughout the whole field of general education. As a program element an appreciation course is fundamentally the same as a science-type course: it is the definition of an aspect of education. Structurally, it is a thing essentially different from a science course.

UNITS.—Nevertheless, systematic teaching implies a workable list of objectives. Otherwise we begin nowhere and end nowhere. Without such objectives we have no definite purpose and no possibility of a definite check on our own teaching and on that of the family and primary school which have gone before. Now we find such a list of objectives, as we must find it, inherent in the forms through which our different cultural media, including conduct, have evolved. In establishing the corresponding preferences and discriminations step by step we are merely bringing the pupil up to date which is only another way of saying that we are bringing him to maturity. In the three chapters which follow we shall have occasion to develop and justify such lists of units for literature and conduct and these must stand as examples of unit organization throughout the appreciation field.

IV

FUNDAMENTALS OF OPERATIVE TECHNIQUE.—The scientific background for the practice of teaching in this type is meager but increasing. Perhaps our most illuminating material is to be found in the case studies of behavior problems which social workers of various interests have contributed and are contributing. Studies in the general field of mental hygiene, although they of course deal in the main with the pathology of behavior and personality, are nevertheless full of suggestions touching the treatment of the normal child.

Even more critically than is the case in the other types, our operative technique here must rest on the principle of apperception. True it is that no principle in the science type can be assimilated by the pupil unless there is a background of experience to which it can be related. Nevertheless, as we have seen, given this apperceptive sequence, one can select and teach a unit in the science type. Not so in the appreciation type. Here, we are obliged to find in the pupil some liking which he already has and build our structure thereon. Perhaps the difference between the types is simply a difference in the extent and variety of the respective apperceptive masses in individual pupils which are likely to exist. Perhaps it is due to temperamental tendencies to develop this or that kind of personality. Whatever the explanation, the principle seems to be incontestable: We can get some pupils to accept a given value in a given course and others we cannot.

CULTURAL BACKGROUND.—Our fundamental problem is, then, to build up in pupils from their earliest days in school a rich and varied experiential background of values which are calculated to appeal to many different individuals.

LITERARY READING MATERIAL.—First in order of importance here is an abundance of literary reading material, not informative merely but literary. Provided the children can be given the reading adaptation early in their school lives, before the age of eight if possible, and then put in contact with an abundance of good reading material, the author has found little difference be-

tween the child of the city slum, the child of the remote rural school, and the child of the cultivated family. There will be marked differences between individuals of each of the three classes but not between the classes themselves. If children are taught to read, they will ordinarily read. If children do not attain the reading adaptation or if they are long delayed in attaining it, they cannot as easily be put in contact with good reading. They become rapidly less plastic, for their out-of-school experience is apt to make them less and less likely to respond to children's literature, though they may still be interested in informational material. The same result will appear if, having attained the reading adaptation, they get no contacts with literary reading material. As the child grows older in his school experience, it is of course essential that he shall never lack for material which is likely to appeal or which may appeal. The school's reading-room and the reading tables of the schoolrooms become one of the school's chief implements of education, second in importance only to the teacher.

MUSIC.—The pupil should hear an abundance of good music from his earliest school years. Happily, the availability of instruments for the rendering of the best music has made this possible in literally every school. Nor is a regular "music period twice a week" sufficient. The victrola or similar instrument should be set to playing informally whenever there is a suitable opportunity—at recess times, for instance—and essentially cheap records should simply not be within reach.

THE SCHOOL BUILDING.—He should attend school in a worthy and dignified example of architecture, not an expensive nor ornate building. Buildings which are beautiful in their simplicity are often the least expensive, and they are perhaps never ornate. The rooms and corridors of the building should contain many representations of the best examples of painting which appeal to children and young people.

SCHOOL ADMINISTRATION.—Most of all, the administration of the school and the teaching force should be well equipped to rec-

ognize and apply the principles which lead to the willing acceptance of those values in conduct which are ultimately built into the mature personality. Many volumes have been written touching this general issue, and we shall return to the matter in later chapters. Suffice it here to emphasize its significance in the basal technique of the appreciation type. The literature of mental hygiene is full of instances in which the whole structure of the personality has been warped and the pupil's later acceptance of conduct values perverted by unhappy experiences at school, which the teacher or the school administration or both have allowed to pass uncorrected and to become parts of the apperceptive mass to which later conduct is assimilated.

PATTERNS.—It is quite impossible for the best of teachers to establish appreciations in pupils in whom there is nothing to build upon. Hence the primary importance of cultural background. Nevertheless, in effective teaching in the appreciation type dependence on the personality of the teacher is at its maximum. A science or history teacher can learn to teach, provided he knows his subject matter, at least so far as the subjects themselves are concerned. In the appreciation type the teacher must not only know the subject-matter which he utilizes, but he must himself be a pattern of the values which he expects to establish.

There is little doubt that the adaptive mechanism which operates in this field is an organic tendency in the immature person first to follow the emotional patterns of the adults to whom he looks for guidance and second to like what they like. The young child commonly takes on his true fears by copying the fears of his parents or of the casual nurse-maid. His progenitors, all the way back into the prehuman series, have done the same and that is why the child has eventually arrived in this vale of perils. The fawn which fails to copy the flight impulse of the doe is conveniently edible and does not contribute his peculiarity to the cultural resources of his race. True it is that the child sometimes copies fears which ought not to be fears at all, and equally he copies likes and dislikes which in themselves are primitive and

wrong. But if he had no impulse to copy at all, his values would remain at the level of those of savages and perhaps even pre-humans.

GUIDANCE.—Now the child is born into a social institution, the Family, and before many years he is inducted into another social institution, the School. Thus his natural guidance media in civilization are set up for him. But a family is no better than the parents nor is a school any better than the teachers. Neither family nor school establishes its claim to fundamental guidance apart from constraint of the young into its institutional controls. Beyond that point, the normal child undoubtedly accepts the institutions of his race; he tends to respect his parents and his teachers—even though we parents and teachers at times make unreasonable demands upon his respect. He admires his father as the most remarkable of men, and whatever the teacher says is so.

TEACHERS.—In selecting teachers, the governing bodies of schools have from time immemorial named “good moral character” as the fundamental requisite. Of late we who sign the credentials of candidates are requested to estimate moral character on a five-point gradation, on the theory perhaps that school executives are the kind of people who if they cannot have fresh eggs for breakfast are accustomed to exercise discrimination in degrees of badness. No doubt in this imperfect world employers are sometimes prone to enshrine their conceptions of character in a mass of pretense and provincialism and perhaps at times to prefer absence of vice to positive virtue. Nevertheless, the fundamental issue in appreciation teaching is present and recognized: there is no expectation that people of weak or doubtful character will generate strength and nobility through their teaching. The children will not copy conduct patterns if there is nothing to copy.

The principle is not so commonly recognized in the fields of literature and the fine arts. People are likely to be selected to “teach literature” who cannot be utilized for teaching anything

else. "But we must have courses in literature because the colleges require them." Thus our mythical ostrich hides his head. Far better to dispense with literature as an implement of the school altogether than to put it in the hands of a teacher who has neither taste nor liking. The teacher who has genuine taste and enthusiasm for the best seldom fails to communicate both taste and liking to pupils who are still in the plastic stage. The process is founded on the understandable organic tendency noted above and it has empirically been demonstrated many times.

Such teachers are hard to find, but there are probably more of them than we think. The initial problem is for the administration, through its organization of courses and its development of an appropriate technique, to make it possible for the potentially effective teacher to operate.

CREATIVE COURSES.—In most of the appreciation fields there has always been a tendency to attack the pedagogical problem through what have come to be called creative courses, that is to say, through practice in craftsmanship. Thus, in a day which we hope has been left behind, complacent little girls and rebellious boys were constrained in the pathway of musical appreciation through compulsory piano lessons. Young women were taught "painting" and they produced landscapes in which it was hard to distinguish between mountains and haycocks. More recently, children who were far from having learned the primary art of obedience were taught self-government through the fateful device of organizing the school as a city government. As we have seen (page 95), this sort of educational inversion has at one time or another characterized much of the program content.

Now, though all such attempts have no doubt been well meant, they have very generally been based on sundry misconceptions of purpose and on confusion of means and ends.

The school does not exist for the purpose of training artists and professional people; its function is the development of sane and adjusted personality and good citizenship. It is vastly more important to develop individuals who are capable of appreciating

real artists and sound civic leadership than to attempt the futile task of developing artistry and leadership themselves. Even if it were otherwise, it has not been revealed to us that the Lord ever intended that all people should be artists or statesmen or researchers. Apparently, the scheme of the universe is quite the contrary.

However, there is a certain plausible but none the less mistaken psychology at the basis of the creative theory.

It seems patent that people who are proficient writers or musicians or scholars are capable of higher levels of appreciation than those who are not. The inference is drawn, and probably with justice, that creative proficiency is an aid to appreciation. It does not follow that appreciation is therefore dependent on proficiency. The root of the matter seems to be that we have here another example among many of failure to discriminate between School and University. Artistic or indeed scholarly proficiency undoubtedly contributes refinement in appreciation because it lifts the talented individual to a level of experience which it is neither necessary nor economical that the School attain.

Nevertheless, it is plainly one of the essential purposes of the school to recognize embryonic special talent among its pupils in any field whenever it can, to give to such individuals their chance, and even to give them some training in school along the lines of their special bents whenever teachers can be found who are capable of doing so.

INHIBITIONS.—Each teaching type seems to have its peculiar inhibitions. In the science type, the characteristic inhibition seems to be the memorizing attitude. In language arts and pure practice it is, in different senses, the focalizing of attention on isolated elements. In the appreciation type, the inhibition par excellence arises when the teacher adopts the attitude, "Here is something you should like and you must like." Who has not had the experience? When the teacher adopts the attitude, "This book is in the course, and if you desire credit for the course, you must read it," the pupil may get the task done but he will rarely

make the book serve its educative purpose. He sets up the inhibition in appreciation. If an educational institution sets up its program of study on this basis and expects to generate an educational effect, it deludes itself.

ASSIMILATIVE MATERIAL.—As we have seen, the guidance patterns in the personality of the teacher are the foundation of operative technique. Nevertheless, in this type, even more than in the others, the teacher cannot operate apart from the materials and these are found, in the first place, in the cultural material which has accumulated in the different literary and art forms and in biography, especially the biography of the culture heroes. In the second place, material is found or should be found in the rich social experience of the school and neighborhood life. Thus one of the many reasons why the meager one-room country school and the small family afford, other things being equal, scant material for the development of civilized conduct attitudes.

But the material of appreciation is not determinate. The material in mathematics is by comparison wholly determinate. If the essential doctrine of the equation is to be established, a given round of experience must be set up, and there is no other experience. Experience may be varied in amount but it is all in the form of exercises focused on the unit. If a given exercise cannot be worked, explanations and teaching are called for. Providing the exercises are in fact available, inability to work a single one, is, on the face of things, evidence that learning is not complete. And so in varying degrees with physics, economics, history.

Not so, in literature for instance. In the attainment of taste and preference in the novel, there may be on the tables a hundred excellent examples of novels, and yet if the pupil fails to be aroused by one the appropriate learning may be stimulated by another. No list of titles can be selected and the position taken that acceptance of the list on the part of the pupil constitutes his appreciation of the novel as a literary form of culture.

Not so again in the conduct attitudes. No specific round of experiences can be set up performance in which can be assumed to

generate the appreciations desired, nor would repetition of the same round in any sense constitute such a guaranty.

HARD WORK.—Youth is prone to think that the world owes the individual his happiness. It is hard to learn the lesson that happiness and peace of soul must in the end be sought through hard work, through self-denial, and often through experiences which are the reverse of pleasurable. When the growing young person has reached the level at which he does sense this principle, he is educated indeed. A friend of the author could get little satisfaction from grand opera but he realized that others did so and he thought he saw the reason why. Intellectually, he was convinced that a value existed there which might be his, but which at that time was not his. Accordingly, he trained himself by study and by a frequent attendance which was at times irksome. In the end, the power in appreciation came, and he had a lifelong resource within himself. The classics, whether of art or of nature, commonly refuse to yield their riches to the casual acquaintance. Their riches must be sought. The first impression of Niagara Falls or of the Grand Canyon is likely to be disappointing; it is only in weeks of daily contact that the grandeur makes its full appeal. In the presence of a great painting, we tend at first to make a casual survey and pass on. Its value barely begins to register until we have stood before it several times. In the end, we return year after year and always gain a new sense of value and aesthetic reality. The classics are the great storehouses of the values to which the youth adjusts himself in the appreciation type of experience. It has been said that they are not good because they are old, but old because they are good. For years, perhaps for centuries, the race has been able to find its higher satisfactions in them, and so they abide.

In this final product of the appreciation type, then, the objective comes to be convincing the youth that in his maturity he must actively seek his peace and happiness wherever the experience of mankind has made it evident that they can best be found. In guiding the pupil into this final and incomparably most im-

portant adjustment, the integrity of the school as a teaching institution is again severely tested. The teachers who are concerned with courses in the appreciation type and the personnel officers of the school who are concerned with oversight of the developing personalities of the pupils must all focus their efforts upon the adjustment.

TESTING.—In a unit in the science type we can set up written tests, and, provided they are in structure what the nature of the learning product implies, that is, provided they are “thought tests,” we can secure convincing evidence of the presence of the mastery intended. Even so, we can secure no proof, for proof is a matter of observing unsupervised behavior.

In most cases in the appreciation type, it is almost impossible to utilize the written test even for the securing of evidence. The reason is to be found in the fact that we never can tell whether the pupil is recording what he knows his preferences or standards ought to be or is disclosing what they actually are. A test problem in the science type is intended to reveal in part whether understanding is present or not. If a solution appears, the conclusion is irresistible so far as it goes, but no similar situation exists in appreciation. Hence not only final proof but *prima facie* evidence as well must be sought in the field of unsupervised behavior.

Now, *rapport* testing in the classroom, in appreciation fields which are susceptible of treatment in courses, is revealing, much as it is in science-type courses. That is to say, the teacher can draw certain inferences from attitude in class. But beyond that, regularly organized technique for the recording of significant behavior is the only possible source of evidence. Specific study of such techniques we must defer to the chapters on literature and conduct. In general, the examination attitude and atmosphere must be entirely avoided. There must be no question of “passing” in literature or conduct, the appreciation of music or of the fine arts. The penalty for failure at this point is to convert the teaching staff into an organization of snoopers and the pupil body into a crowd of more or less willing time servers.

CHAPTER XVIII

TEACHING IN LITERATURE—FREE READING

BY the term "literature," as it is used in this chapter and in our discussion of the appreciation type of teaching, we mean any good reading which tends to contribute a sense of sound values in the pupil's developing outlook on life. We do not limit the term to classics or *belles-lettres* in general. We do not include purely informational reading. The objective is conceived to be the development of right attitudes through an abundance of the reading which reveals wholesome ethical and aesthetic values and also an ultimate preference for reading which uses adequate literary forms of expression. There is of course no hard-and-fast dividing line between purely informational reading and that which has a tendency to cultivate right ideals and individual standards of literary taste. *Last Days of Pompeii*, a favorite of some pupils in the fifth and sixth grades, exhibits both sentiment and information. Parkman's studies in the history of New France are invaluable assimilative material for a senior-high-school or junior-college course in history, but they are also a treasure-house of heroic incident and masterpieces of literary style. On the other hand, a supplementary reader in science or geography is seldom more than a body of informational material, valuable for extended reading in science-type courses but not material for the appreciation type.

I

ESTABLISHING BACKGROUND.—Our children come to us from homes of abundant books, in which the child is accustomed to see every member of the family reading a great deal and to hear frequent discussion of books; from other homes in which there is no tradition of reading; and from others still in which the elders

are positively illiterate. No doubt some children inherit temperamental tendencies which manifest themselves as an inclination toward reading while others do not. Whatever the actual genetic story may be, there is no reasonable doubt that most if not all normal children come into the world endowed with purely human potentialities in this direction with which the school can do much, if it begins early enough. We occasionally encounter a pupil at even senior-high-school or junior-college level who has literally never in his life read a book other than those assigned as school exercises. There is not much hope of opening the treasures of literature to such people.

The initial problem of the school is then to begin with the primary period as soon as the reading adaptation has been established, or even earlier, and endeavor to bring the little children into something like a common apperceptive background, that is, a background in experience to which subsequent desirable experience can be matched. The story period, even from the day when the child comes to kindergarten, is a manifest opportunity. It would not be impossible to trace a very plausible connection between a student's real profit from a college course and a fortunate start in a good kindergarten.

So far as reading is concerned, as we have repeatedly seen, the meat of the matter is to expose the primary pupil to an abundance of good material which he may utilize for free reading. And happily there is an abundance. Not only has the typical school reader come to be a work of genuine merit, as well from the standpoint of content as from that of pedagogical organization; but there is a goodly body of new material like the books of Beatrix Potter and Burgess. A rapid survey of the reading tables in the primary school on a certain day revealed the following list available to the children and liberally used by them:

Many school readers

Mother Goose

Several of the Beatrix Potter books

Thornton W. Burgess

Story of Three Bears (illustrated)

Alice in Wonderland

Just So Stories

Howard Pyle's *King Arthur*

Gulliver's Travels

Arabian Nights

Peter Pan (illustrated)

Child's Garden of Verses

Uncle Remus

Eugene Field Reader

The culmination of the primary period could not be better set forth than by the quotation from a work report which follows.

TABLE VIII

WORK REPORT

Pupil	Animal Books	Fairy Stories	History	Miscellaneous	Total
1.....	5	5	2	8	20
2.....	2	2	1	5	10
3.....	1	.....	2	.....	3
4.....	2	2	9	6	19
5.....	2	1	1	5	9
6.....	9	1	1	3	14
7.....	1	4	2	6	13
8.....	2	.....	1	1	4
9.....	1	.....	4	1	6
10.....	1	1	7	1	10
11.....	3	4	3	3	13
12.....	.....	1	6	2	9
13.....	.....	.....	8	2	10
14.....	4	4	5	1	14
15.....	4	.....	1	2	7
16.....	3	4	4	.....	11
17.....	3	.....	5	2	10
18.....	2	2	2	4	10
19.....	2	3	3	1	9
	47	34	67	53	201

The period is April 4-June 13, 1924. The pupils are none of them beyond third-grade level. "The children have learned to use the library and they show considerable judgment in the choice of books." A tabulation of the reading of a section of nineteen pupils is shown in Table VIII.

The record is good evidence of the presence of the reading adaptation, except perhaps in the cases of Pupils 3 and 8, but not in itself conclusive proof. An eight-year-old child does not of his own accord read a book each week if he has any particular trouble with reading as an art. It is, further, good evidence that most of the children in this section have probably established a working background for the development of inclinations toward good reading.

Some of this reading might have been done at home. Probably most of it was, in fact, done in the schoolroom—not in the school reading-room, but in the schoolroom. In the cases of the majority of young children, as we find them in the public schools, small reliance can be placed upon the resources of the home. Therefore, the veritable foundation of the child's whole educational development rests in large measure upon the book tables of the primary school.

II

THE READING ROOM.—Given actual reading ability and contact with abundant book and periodical material, most children will read very widely. Hence the school reading-room. The reading-room should of course be in charge of a teacher who is qualified by education, by training, and by natural aptitude, to guide children in their choice of reading. The room, as far as appreciation is concerned, secures two important ends. It is the source of expanding experience with books which are calculated to generate growth in sense of values; and its records are the test of the pupil's progress.

SELECTION OF BOOKS.—Of course, the selection of books is the primary consideration. The situation is not unlike that presented by the pupil's dietary at home. If the family provides a proper amount of wholesome, palatable food, in the appropriate nutritional balance, the child will grow in a healthy and normal manner, other things being equal. If the food appeals to the palate but does not nourish the bodily frame and substance, the child will not grow as he should, and he will be peculiarly subject to

the attacks of various maladies. A similar result will appear if the child is compelled to eat unpalatable food. He may gormandize, and his normal growth will suffer in consequence. Finally, he may eat food which is palatable but unwholesome and even poisonous. The analogy to the selection of books is close. A great many books of the cheap juvenile order are agreeable to the taste but they build up no sense of values. Quite the reverse; a prolonged diet of such leaves the pupil unwilling to read anything which does not contribute to day-dreaming. If the pupil is assigned a reading course composed of books which his elders think he should like and he is compelled to write a series of deadly things called "book reports," he will not only profit nothing but he is more than likely to acquire an aversion to reading altogether. Especially in the upper period of the secondary school, the senior high school and junior college, the pupil may encounter many books of a poisonous character. Prevailing, such books belong to the region of perverse literature. But for timorous enforcement of federal laws, many of them would be excluded from the mails. The authors are commonly people of some literary talent but afflicted with emotional disorders well recognized by the mental hygienist.¹ Not only do such books tend to establish in youth perverted sense of values, but they not infrequently

¹ For instance Dr. Frankwood Williams in "Some Social Aspects of Mental Hygiene," *Annals of the American Academy of Political and Social Science*, Part III of Vol. CXLIX, May, 1930, makes the following statement:

"The amount of social damage that an editor of a great daily paper can do, socially well placed and influential, economically independent, intellectually keen, and well trained in the best of our universities, but so emotionally handicapped that he can see life, or certain aspects of life, only through lenses that he has had to put on as a matter of personal protection against his own unsolved or badly solved or partially solved personal emotional problems . . . is unlimited, incalculable." Dr. Williams very properly includes with the editor the politician, the judge, psychologist, sociologist, social worker, psychiatrist, minister or priest, teacher, industrialist, labor leader, economist. Each is in a position in which he or she is singularly able to infect others with his or her own infantilisms and perversions. Some of us can recall specific instances for each of these classes. Nevertheless, none of them is equal to the editor or popular writer in his capacity for harm because none of them reaches so large a public.

infect the young person with the very maladies with which the authors have become afflicted. Finally, the pupil may read too much, just as he may eat too much. In that case, he is induced to spend more time on the playground or in the school shops.

Now the school cannot control the pupil's entire experience of life or of books, but through skilful and systematic co-operation with the home it can do much. Most of all, it can rigorously weed out all harmful books from its own shelves. If the school succeeds, during twelve years of the school life, let us say, in building up a sound sense of values in the pupil's appreciation of life, the latter will tend to turn aside from much poisonous material just as the well-nourished body throws off the toxins of unwholesome food. Guidance but not constraint in the pupil's free reading is the teaching precept. The first step in effective guidance is accomplished when a system of wise selection is in operation.

GUIDANCE.—In the second place, the teacher must know her shelves and get to know the pupils. The latter is more difficult than the former, but it can be done. There should be a reading-room and reading-room teacher for perhaps every two hundred and fifty pupils in Grades IV–VI, for every five hundred from the beginning of the junior high school to the end of junior college. This teacher has an advantage over most other members of the staff, since she meets all pupils in the school, or at least all in her group, while classroom and departmental teachers meet only certain sections from time to time. Nevertheless, it is always possible for the reading-room teacher to pool the impressions of a given pupil which have been acquired by several teachers. In the end, the teacher fits the book to the pupil at his present stage of development.

Guidance is essentially salesmanship. Initially, much depends upon the accessibility of books. It is amazing to note the difference between the appeal of books which lie title upward on a table and the appeal of others which stand on shelves, especially if the latter are beyond the pupil's reach. The shelves, however, are open to the pupils. The ideal general study-room of the school

or of the group is the reading-room with books shelved about the walls, accessible to all pupils and in plain view from the teacher's position. There will be a certain loss of books under this plan, but loss can be reduced to a minimum. The cost of a minimum annual loss is one of the most distinctly profitable expenditures which the school can make. It is likely to represent the cost of an effective piece of educational procedure, whereas the saving which accrues through having books checked across the librarian's desk would be at the expense of the major portion of the reading-room influence upon the pupil. Of course, pupils should be trained to check out books which are withdrawn for home reading. Here again, systematic home-and-school co-operation accomplishes much.

The salesman convinces his customer that the latter desires the commodity which is offered. The modern salesman makes no attempt to "cram a sale down the customer's throat," nor does he effect the sale of goods which he knows beforehand are not likely to prove satisfactory. Similarly, the good teacher, in guiding the free reading of the children, will avoid using the strong arm of school compulsion and likewise will try to avoid inducing a child to read a book which is unlikely to appeal to that particular child.

A certain teacher of rare good sense was teaching a ninth-year class in *Ivanhoe*. The work was being dramatized, and most of the pupils were enthusiastic. Their free reading was for the most part wholesome and abundant. One girl, however, was getting nothing out of the literature period, and reading nothing. Many teachers would have classed her as "dumb" and let it go at that. Inquiry elicited the fact that she had recently come into the system from a school in which reading meant simply oral exercises from graded readers, and the further not uncommon fact that she had literally never in her life, of her own accord, read a book of any sort. The teacher knew the pupil and gave her *Little Women*. She read it with interest, called for more, and became quite a different sort of girl.

Guidance should be systematic. The tabulation found on page

If undesirable books appear in the home-reading list, as they will, the teacher refrains from saying "Naughty, naughty; that is a bad book." She rather puts the pupil in contact with better books and waits patiently for the result. In her occasional conferences with the parent, she talks good reading.

But, thinks the reader, "How does the teacher know that the pupil has really read these books, and read them thoroughly?" The answer is, "We do not care." We are not dealing with assimilative material in arithmetic or physics or history. As soon as the pupil knows that he is really free to read anything he pleases and as much or as little as he pleases, he will keep a truthful record. The following is the list of a pupil in the fifth grade for books read between October 24, 1923, and January 24, 1924:

<i>Ivanhoe</i>	Retold by Alice Jackson
<i>Stories of Three Saints</i>	MacGregor
<i>Stories from the Crusades</i>	Kelmen
<i>History of France</i>	Marshall
<i>The Little Crusader Cousin</i>	Stein
<i>The Great Army</i>	Letts
<i>The Little Hunchback Zia</i>	Burnett
<i>The Little Book of Our Country</i>	Tappan
<i>American Hero Stories</i>	Tappan
<i>The Brushwood Boy</i>	Kipling
<i>Last Days of Marie Antoinette</i>	Gower
<i>Primrose Ring</i>	Sawyer
<i>Stories of Greece and Rome</i>	Baker
<i>American History</i>	Price and Perry
<i>Merchant of Venice</i>	Shakespeare
<i>Decline and Fall</i> (15 pp.)	Gibbon
<i>Last Days of Pompeii</i>	Lytton
<i>Hero Stories from American History</i>	Blaisdell and Ball
<i>The Wonderful Adventures of Nils</i>	Lagerlöf
<i>The Burning of Rome</i> (few pp.)	Church

There is much food for thought even in this short list. It is tolerably evident that the little girl is telling the truth without pretense. The readings are in the order in which they were done,

and one can trace threads of sequence from book to book, interrupted by browsings in different fields. She attacks Gibbon, and of course finds it too much for her. It is interesting to note that she returns to the attack the next year, but with no better success. The same fate attends her attacks upon *The Burning of Rome*.

BEARING ON COURSES.—The pupil's free reading is unconstrained behavior. The character of his reading is therefore perhaps the best evidence we can secure bearing upon the issue, Has instruction in literature registered? As the pupil's reading records accumulate, it is very easy in the cases of some pupils to trace the definite influence of classroom instruction. In the cases of others, there is no such evidence. In the cases of some, there is evidence that literature teaching has had no effect. The instructor who is a teacher of pupils rather than a teacher of books finds some of his best guidance in the reading-room.

When the pupil has reached junior-high-school level, his range of interest is apt to expand, and he encounters in a well-organized program of study a broader range of content courses. He is likely to read more. Accordingly, the device here described is utilized for keeping track of his reading. He is given two sets of 4×6 cards, one set in white and the other in buff. On the white card he records all books read in or in connection with his literature courses; on the buff card are entered the titles of his free reading. Precisely the same principles are observed as those described for the guidance of reading at elementary-school level. I have before me a typical set of such cards for a junior-high-school pupil, a girl.

The list of sixty-nine titles on the free reading card, running from October 9, 1922, to December 4, 1923, is too long to record here. Some of the titles, it should be observed, are simply those of periodicals which were probably read only in part and others those of poems. There are on the list, however, the titles of thirty-eight books. From the first of October to the following March, there appears only one reading which would classify as desirable educative literature. There are twenty-four titles in this period, mostly those of extremely popular periodicals and washy juve-

niles. Of the forty-five titles in the period running from the last of March until the following December there are but five of the type which prevailed in the earlier period. Like all the rest of us, the pupil occasionally falls under the influence of the old Adam, or, perhaps in this case, the old Eve. Among her better reading is *The Alhambra*, a list of thirteen ballads, a course of Wilkie Collins, Papini's *Life of Christ*—all read because she wished to and not because she had to. We note on her white card that she began the year with first-year literature, and at the beginning of the second semester she entered the "Community Life" course with its rich reading in related literature. Early in the spring, the influence of these two courses began to appear. Now, this child made her first contact with the better type of reading at the beginning of her first high-school year. Is it not likely that, if she had enjoyed the same reading-room opportunities which the fifth-grade child cited earlier was enjoying, she would have come to junior-high-school level not only with a much better apperceptive mass in this field but with a much better sense of values?

Another pupil, a boy, who has had the reading-room contacts of the elementary school, exhibits less favorable symptoms. Sixty-four titles appear on his buff card for his first high-school year, seventh grade, thirteen of which are numbers of the *Youth's Companion* and *American Boy*. About twenty others are juveniles of the type of the inevitable Tom Swift and the impossible Mark Tidd. Among the remainder appear Jack London, Seton, and Conan Doyle. There also appear Howard Pyle, J. F. Cooper, and Jules Verne. The boy is plainly very much in the thrill-hunting stage, and it is of course entirely possible that he will never come out of it. Nevertheless, the teachers have a solid basis of recorded genuine pupil experience on which to work. We are curious to find out if there has been any real progress, and so we turn to his card for a period two years later, the fall of 1924. In a period of nine weeks we find the following list:

Story of Ab

Before Adam (Jack London)

American Boy
Mark Tidd Manufacturer
Mark Tidd's Citadel
Boy Electrician
Story of Mankind (Van Loon)
The Tempest (Shakespeare)
American Boy
Hamlet
A Tramp Abroad (Mark Twain)
Romeo and Juliet
Silas Marner

After all, the boy is growing, appreciably rather than vigorously, although we may suspect that his reading of Shakespeare and George Eliot represents an honest effort to seek the better values than the satisfaction itself. However, we also note that this fall he was in a "Classics" course.

III

CONFERENCE GROUPS.—If we provide for the apportionment of a reading-room to every two hundred and fifty pupils in Grades IV–VI, in schools in which the first three grades use their schoolroom reading tables, we shall have groups not too large for the oversight of the reading-room teacher. She meets them year after year, and she can, as we have seen, pool the current knowledge of pupils which other teachers possess.

Five hundred pupils in a school which includes junior college all use the high-school reading-room. In a six-period school day, with one period for physical education and four for classroom study, there will be in the vicinity of eighty-five pupils using the reading-room at each period. This is not too large a number for supervision, but five hundred is too large a number for the teacher's intimate acquaintance and guidance. Hence, it comes to be desirable to organize conference groups to meet with teachers, perhaps once a week or once in two weeks.

At these conference periods, teacher and pupils talk over read-

ing. Now, to be effective, the conferences must be informal and intimate. In other words, the teacher must get to know the pupils whom he or she meets, and of course the teacher must be gifted with genuine tact in dealing with young people. Needless to say, the teacher must have an extended and somewhat intimate knowledge of books and of the reading ways of young folks. The efficiency expert is distinctly out of his element in arrangements for such conferences. The teacher who turns to the pupil, on the entrance of the latter, with cool professional air, selects a formidable-looking card from a cabinet, and proceeds to probe the pupil's inner consciousness will accomplish very little indeed. Rather the greeting will be, "Well, John, what have you been reading lately?" Or, "How do you like ——?"

Ideally, every pupil should be in such a group throughout his high-school years. Practically, this is seldom feasible. The group assigned to the conference leader must be small enough to enable the latter to know well each of the pupils and to keep in mind the ways of each. In a fifty-minute period, there is time for perhaps four or five conferences on the average, time for the teacher to see twenty to twenty-five pupils each week when the teacher has one conference period each school day. Some teachers may carry on a cycle of two weeks before returning to the first pupil; others may not be able to know so many. Perhaps a group of fifty to each such teacher, each pupil of the group coming for conference once in two weeks, is a maximum allowance.

Many pupils, however, arrive at reading self-dependence comparatively early in the high-school period. Their reading tastes are substantially formed. Others come from homes in which reading is guided as well as the school can guide it or better. Hence the maximum allowance for group conference is materially reduced in the presence of one or both of these considerations.

CORRECTIVE INFLUENCE.—We have several times referred to the menace of perverse literature, or writings which have real merit as examples of literary craftsmanship but whose whole content and philosophy of life are expressions of a perverted emo-

tional life in the author. Such books have become particularly numerous since the Great War. As a class, they exhibit a shallow wit and recklessness of statement which are singularly well calculated to mislead the later adolescent—perhaps because the authors themselves are apt to be examples of personality development retarded at the adolescent stage. Boys and girls of parts are prone to find these books somewhere and read them. Oftentimes the parent in his innocence mistakes such reading for evidence of superior taste and wisdom in his offspring. The school cannot prohibit such reading; to do so would only increase its appeal. It can carefully exclude the like from its own shelves and classrooms and furnish an abundance of more wholesome material. But that is not enough. It must set the pupil right by exposing the shallowness and perversity of such writing, usually a simple task if the teacher himself has arrived at the stage of maturity and culture which makes him a competent teacher at senior-high-school or junior-college level. The conference group, tactfully handled, gives us our best opportunity for the identification of such pupil problems and for appropriate correction.

Thus, in the reading-room and its records, in the pupil's free-reading report card, and in the group conference, we have the means of systematically guiding the pupil in his contacts with the best values of literature, of studying his individual growth, and of securing as valid objective tests of the extent and direction of that growth as is perhaps possible in the appreciation type.

CO-OPERATION OF HOME AND SCHOOL.—It is perhaps not too much to say that the whole process of general education depends on effective co-operation between home and school. Each must do its duty by the pupil, and it must act intelligently. The home, however, in most of the field with which the school is concerned, has long since become dependent upon the latter for guidance. In the school subjects which belong to other types than that with which we are now dealing, effective co-operation consists largely in an intelligent apprehension on the part of the home of what the school is trying to do and then refusing to meddle with school

processes. In the appreciation type, however, both in the region of conduct and in that of growth in acceptance of sound cultural values, it is essential that, as far as possible, a plan of positive co-operation be organized. The principle has special application in the matter of the pupil's reading.

Of course, in some homes there is no reading at all. In others the child's reading growth is nourished and guided quite as well as the school can guide it. Neither of these classes of homes creates any formidable problem. A great middle class, however, is composed of homes in which there is perhaps the most genuine concern for the right upbringing of children but, as far as reading is concerned, a minimum of wise guidance. It is this region in which the cheap juvenile flourishes. The chief characteristics of this type of reading remain much the same from generation to generation. The grandparents of our children were apt to read juveniles in which the characters were impossibly and unwholesomely good; the parents lived with day-dream children who were impossibly heroic; the juveniles of today usually exhibit youngsters who are impossibly clever. In all, there is a set of rewards for the righteous and punishments for the vicious which could scarcely exist in any sane world. The success of a best seller in this field consists in its capacity to arouse the maximum of thrill with the minimum of mental effort on the part of the reader. The child who is once thoroughly inoculated with this type of reading is apt to read nothing else, and it seems to have a tendency to control his whole future career as a desultory reader. A single home in which it abounds is apt to infect the whole neighborhood. Hence, the task of influencing the home. The opportunities are too many for enumeration here. The two suggestions which follow will illustrate.

Well-nigh every such home is in a quandary at Christmas time as to presents for the children. Books suggest themselves. The tables of the bookstore are piled high with examples of the extremely profitable type of commodity to which we have referred. A set is purchased, and judging by the results the present

is highly successful. For a long period of years, the return of the season augments the stock on hand. Now, most parents on the whole desire to do the right thing by their children. Hence the opportunity of the printed school list of books for Christmas presents, especially for the younger children. Obviously, the effect of such a list will depend upon the character of the books recommended and upon the ingenuity with which the list is presented, but, appealing or otherwise, the effect of such lists year after year is bound to be cumulative.

The parent-teacher association movement is potentially perhaps the most effective means of setting up the school-home bond which we have. An appropriate program for at least one meeting each year may well center around the topic, "Children's Reading." The teachers explain to the parents the program which the school has and which it is trying to carry out. Some general considerations touching the matter of reading are presented. Examples of good and bad reading are drawn in illustration, and, finally, suggestive lists of reading are presented.

CHAPTER XIX

THE COURSE AND UNITS IN LITERATURE

AS SOON as we give over definitely the notions of time-to-be-spent and ground-to-be-covered as guiding principles in teaching and school organization, and adopt in their place certain learning products in the form of adaptations in the evolving personality as teaching objectives, the rationale of courses in literature becomes at once much more intelligible. We no longer think of such courses as being *Miles Standish* and *Evangeline* in the seventh grade; *Snowbound* in the eighth (all the way from New England where it has a possible meaning to Oregon where its meaning is, to say the least, far-fetched); *Ivanhoe* and *The Talisman* in the ninth; and the "requirements for reading and study" thereafter.

Rather we ask ourselves the questions, What ends in general education does literature serve? What is its functional place in the organized school? What ought to be the character of courses in literature?

I

THE PLACE OF LITERATURE IN GENERAL EDUCATION.—Literature as the product of one of the fine arts is one of the major contributions to the structure of civilization. "Literatures are to society what individual memory is to each one of us. It makes relatively little difference, therefore, how superior some other language may be in its vocabulary and in its grammatical forms; the vernacular of a people will tend to survive because of that which it carries in the way of traditions and popular ideals."¹ Judd is arguing here the problem of survival of languages but for our present purposes the implications are as important as his fundamental thesis. Literature is one of the vehicles of trans-

¹ Judd, *Psychology of Social Institutions*, p. 190.

mission from generation to generation of those values which make civilized conduct and emotional sanity possible. It seems to me to be a tawdry and inadequate notion to think of literature as being chiefly ornamentation of life and to admit to the category whatever is clever and artistic in form and expression. Similarly, it is a poor sort of conception of human history which makes politeness and polish and finished demeanor the approximate synonyms of civilization. Civilization in its etymology goes back to the great Roman term *civis*. To be a Roman Citizen, in the days when Rome had a civilization, certainly implied much more than the graces of the drawing room or the foyer. Much better the definition which has been growing in favor and which holds civilization to be the art of living together in society. When we thus allow our minds to ponder the terms civilization and citizen, there pass down the stream of consciousness Law, Power, Honor, Ideals, Character. And so literature is the carrier of civilization, just as the products of the other fine arts are carriers, only more so; a national literature is an essential instrumentality of a strong and well-ordered society; establishing vital contact with the great in literature is before all else part of the process of citizenship training.

Apart from its transmission of conduct ideals, literature makes another, and perhaps little noted contribution to civilization. The educational products which rise out of it on the whole tend to make possible an extent of communication among educated individuals which is probably altogether out of the question for the uneducated. The individual who is in possession of literary forms of speech is articulate, quite beyond the capacity of the individual who may otherwise be enlightened but who is devoid of the form of culture which is embodied in great or near-great literature. The latter's discourse may be excellent in diction and composition but his vocabulary is meager and inelastic, and he is prone to lack the range of metaphor and turns of expression which assuredly cannot be learned from the language book and which are not likely to arise from the most faithful training in the

expository treatment of science-type subjects. More than that, both our common and our literary speech are full of trenchant expressions which, originating in the wit of some writer long since forgotten, generalize so much of human experience that they have become a sort of higher alphabet. "Man proposes but God disposes" goes back to Thomas à Kempis in the fifteenth century and beyond him to a more remote period. "We never know how the other half lives" many readers likely enough would assign to the Roosevelt social-betterment period, but it has done duty from the time of Rabelais. The "soul-less corporation" is not a product of the Populist period, it comes down to us from Sir Edward Coke. And so on with thousands like them, which have entered the common speech. On the other hand, there are innumerable instances of the same general type which are useless unless both the speaker and his hearer are familiar with the content in which they are found. For instance, that marvel of satiric generalization "a Pickwickian sense" means nothing to a person who is unfamiliar with the episode which gave rise to it. And so great literature is sometimes the basis of a sort of free-masonry of culture.

Finally, it must be remembered, the great body of accumulated wisdom and common sense of the race is contained in its literature and it therein serves as the stabilizing influence which tends to keep the disclosures of science in sane perspective. To repeat an expression already used, the scientific outlook on life, apart from this cultural matrix, easily becomes hypertrophied. The fact that the English-speaking race rules by far the largest part of the earth today is traceable quite as much to the general principle that the Englishman "knows what is cricket" as to his awareness of the law of supply and demand or of the notion of basal metabolism. We sometimes say with truth that a man ought to be a gentleman before he is a scientist.

II

FUNCTIONAL PLACE IN THE ORGANIZED SCHOOL.—Now, if it were necessary, in order to utilize literature as an implement of

education, to cover the whole range of even the literature which is written in English alone, the use of literature as a school subject would have to be abandoned at the outset. But such is neither necessary nor desirable. Here as elsewhere in this field, the learning objective is not content but appreciation. Specifically, the objective in literature is *discrimination* between good and bad, between the tawdry and the valuable, between the clean and virile on the one hand and the degenerate on the other; and *preference* for the better. In brief, the objective is cultivated taste.

While it is quite true that good courses in literature and competently guided reading will contribute much to wholesome and right outlook on life and to conduct ideals while courses and reading are in process, we are much more concerned with what the pupil will read after his school days than with what he reads now, with adjustment rather than with "the well-stored mind." With this view of the function of the school in mind, the theory under which courses are organized and teaching pushed forward is quite different from that which is the logical implication of the notion that the school is concerned wholly with content. Under this latter theory the program in literature must be fragmentary at the best; under the former, it may be complete.

III

There is strictly speaking but one course in literature in the whole field of general education, if we conceive a course to be the definition of an integral part of the program, as I think we ought to conceive it. There are several courses in mathematics because there are several mathematical fields, and several courses in science and history because there is more than one level in each. Each of these courses has numerous units. If we felt that training in the structure of the various literary forms were an essential part of general education, then we should require many courses in literature. Thinking of education as adjustment, however, the problem at once comes to be putting the pupil in adjustment with his inheritance in literature through his development of *discrimi-*

nation and *preference*. Such adjustment is a long process and it has to wait the evolving experience of youth.

Hence there is a single course and it may extend throughout the whole program of the secondary school.

THEORY OF UNITS.—We then naturally turn to a quest for reasonable units, chiefly because here as elsewhere an organization is essential if we expect to make systematic progress.

We should be overworking the unit idea if we were to divide the whole field of literature up into arbitrary parts just for the sake of having units. Something like that apparently happens when teachers merely classify subject matter under such heads as nature poetry, classics, contemporary writing, and so on. No doubt such divisions are greatly to be preferred to the meaningless administrative divisions which bear such names as English I, English II and so on—literature three days a week and composition two days.

The pupil in his free reading, like older people, reads all sorts of material; he does not read according to a framework of literary classifications nor yet according to the series of literary forms which we suggest as feasible units. We might leave him to his free reading under the guidance suggested in the last chapter and organize no course at all, were it not for the fact that he would thus as a general thing not find his way into the best that literature has to offer, and for the further fact that mere protection from the influence of poor stuff is no substitute for the positive cultivation which qualified teachers can give.

Hence it is desirable that from an early period in the secondary school pupils should be brought under positive training as well as provided with the rich background of the free-reading room. Any such positive training whatever implies a series of objectives which is in its nature limited and which bears some intimate relation to the pupil's developing literary environment. In other words, we are in the presence of our old problem of finding significant aspects.

Now we seem to find such a series in the different literary forms

which have been invented in the course of long social experimentation in the search for effective media of literary expression. Long, long ago, for instance, men found that they could convey certain messages in poetic rhythm and imagery better than any other way, and conversely their audiences could derive peculiar satisfactions in that form of discourse. The discovery has had lasting value, so that searching human experience still finds poetic expression. And so with the drama, the novel, and oratory. Some forms have evolved to meet new social needs, like the short story, the newspaper, the periodical. Others still have been modified by the discovery of mechanical means of expression and so the movie is apparently a case under the general form of the drama. The literary forms are therefore not only racial in character and indubitable aspects of literary environment but the list is limited and comprehensive. They have the characteristics of good teaching units.

The list which follows has been worked out for use in the Laboratory Schools, although it has not at the time of writing settled fully into its place in the structure of the program.

UNITS IN LITERATURE

- I. Short children's tales in short-story form
- II. Ballad and narrative poetry
- III. Movie
- IV. Novel
- V. Biography
- VI. Newspaper
- VII. Mature short-story
- VIII. Periodical
- IX. Drama
- X. More mature poetry
- XI. Essay
- XII. Public addresses

WARNING.—The reader must not mistake the purpose of this unit structure. It would be educationally useless to set up the forms themselves as objectives of study and learning. The class

is not set to study the novel, for instance, for the purpose of finding out how novels are made. The literary forms are valuable for our purposes because they constitute the structure of literature as a whole and because we should probably never have had any literature without them and likely no real civilization. The Greeks showed us how to put that part of civilization together, just as the Romans showed us how to put civil law together. They make a good list of units just because we are trying to make boys and girls into civilized men and women.

ORDER NOT IMPORTANT.—The list is laid out somewhat in accordance with developing childhood experience, and roughly in accordance with the order in which children's and young people's interests turn toward the different literary forms. But there is otherwise little of value in the order in which the units appear. Ideally the course should begin as soon as the pupils have learned to read and have thus passed over into the secondary period of learning. Ideally again, it should be open to the end of the junior-college period.

A CHECK-LIST AS WELL AS A COURSE.—Nor does it necessarily follow that all pupils should follow the entire course. The influence of the cultivated home is potent in this field as nowhere else. In a school system which is cosmopolitan in character, there will be some children in nearly every unit who can be checked off as being already established in their tastes and in their inclinations to read. In rare instances there conceivably may be pupils who can be released from the whole course. It is not altogether uncommon to find pupils at junior-high-school level, or a little beyond, who are already comrades of a good teacher in their judgment of a good novel. The writer has met senior-high-school boys whose choice of newspapers, and information regarding the field, was such that he could not pretend to advise them. And so with nearly all the units, save possibly the last two.

Now, it is folly to require such pupils to spend time in course work. Curiously enough it is likely to be true that it is more difficult to exclude than to include them, for their very enthusiasm

makes them desire the experience of the unit. Nevertheless, they ought to be led to feel that their time would be more profitably spent elsewhere.

THE CREDIT QUESTION.—I have not infrequently been asked by teachers of literature who are convinced of the reasonableness of the foregoing analysis, What shall be done about credits? How can a pupil who is released on the biography unit, for instance, be credited? What is in the teacher's mind, and in the administrative mind, is of course time-to-be-spent and lesson-performance and not education. If the teacher has evidence which satisfies him that the pupil has the learnings in appreciation which a series of units implies, credit for those learnings, which is in its nature a record of the pupil's development, is the same whether the learnings have been acquired in class or acquired elsewhere.

It is sometimes objected to such a systematic arrangement as the foregoing that pupils tend to read all sorts of books all the time. Let us hope they do. So do interested pupils refuse to confine their reading to the order of units in a science-type course. But free reading is one thing; systematic training based on a foundation of free-reading and fortified by a continuously expanding background is quite another.

IV

TEACHING PROCEDURE.—In the science type, and in the other types to which we shall presently turn, the objective and its mastery having once been identified, a somewhat definite routine of teaching is implied. The procedure cannot be conceived as a cut-and-dried process, which, being followed, will always produce certain results with the determinism of the factory; but any essential departure from the procedure will either result in non-mastery or uneconomical learning or a learning product other than what the objective calls for.

In courses in literature no such definite procedure is possible. The process is essentially salesmanship in which desires are created. In a science-type unit, the teacher can explain and direct study until the understanding desired is established. Con-

straint of the pupil not only can, but at times must, be employed. And so with the units in practical arts, language arts, and pure practice.

INHIBITION.—Not so in literature. Constraint usually, but not always, sets up an inhibition. One can say to a dawdling pupil in algebra who is at work on a guide sheet, "These exercises must be worked out before leaving the building tonight," and, if the teacher has due regard to the accuracy of the pupil's solutions, the contribution to the latter's learning of which the unit is the ultimate objective will not be very different from what it would be if there were no constraint. If a similar process is used in literature and the pupil is told that he must develop taste, in novels for instance, by the end of the week, the most certain guaranty is set up that he will not do so.

THE TIME QUESTION.—The time required in a science-type course varies for different pupils, but the limits of time required are roughly determinable. In literature, the limits are less determinable for the very reason noted in the preceding paragraph. A six-weeks course in the short story or drama is meaningless. Such organization may be administratively convenient but it is never more than an administrative gesture.

Ideally a pupil should be enrolled in one of these unit courses until the teacher has evidence of the emergence of the appreciation contemplated. To inquire "How much appreciation?" is again to call for an administrative gesture. When the teacher is able to note an unmistakable improvement in the character of the pupil's free reading, the former can have some confidence that mastery has taken place. Here as elsewhere there will be better evidence in some cases than in others. A pupil may come through to the end of a unit and exhibit no evidence of the appreciation looked for. Provided the pupil exhibits no peculiar problem-case characteristics he may well be let go and later on be induced to join another class in the unit.

Per contra, while time-limit constraints are likely to set up inhibitions, it may very well be that a pupil should be required to read certain books which the teacher feels sure are capable of ap-

pealing to him. For instance, note the following quotation from a seventh-grade work report: "A boy in the class who had neglected the required reading throughout October was discovered to have read during that month six of the ——— series (inferior juveniles). Report of the neglected work was sent home and pressure was brought to bear on the weekly report. The next month showed only one book read of the undesirable type and five thoroughly good books read with very evident enthusiasm."

A boy in VIII A, suburban elementary school, between February 1 and February 24 had read seventeen books of a cheap juvenile type. He was an admirer of such and did not like the books on the shelves. The teacher suggested a number of books from which he chose *Dark Frigate*, by Hawes. A few days later he came back delighted and took *Captains Courageous*, *Stockton's Buccaneers*, *The Mutineers*, *Men of Iron*, and others. The boy simply did not know there were better books, and in all probability he never would have known save for this bit of guidance and urging.

ARRANGEMENT OF SCHEDULE.—In a small school, we can easily imagine a teacher conducting a whole section through the entire course, taking perhaps eleven years for the purpose—and perhaps less. Such a teacher might easily embark on a unit only to give it up for the time in favor of another.

The single teacher in a small school is the epitome of appropriate course arrangement for the large school. There, the ideal arrangement would seem to be to keep all the units open all the time, allowing pupils under guidance to have more than one try at a given unit.

THE CLASSROOM.—Much depends upon the arrangement of the classroom and the general conduct of the class period. There is little doubt that, purely as a matter of psychology, the comfort and attractiveness of the physical surroundings have a positive influence upon the individual's emotional reactions. The ordinary classroom with its regularity of desks and chairs and its teacher always seated at a desk in front may not prove fatal to

the reception of literary values, but in such rooms even the most inspiring teacher works at a disadvantage. The arrangement of one of the rooms in the University High School seems to be almost ideal. On one side of the room is an unusually large mul-lioned window and on another a smaller window of the same type. The windows have broad window seats stretching across the width. Opposite the large window in a recess is a small stage, not an essential appointment by any means, but helpful. To the left of the stage looking toward the large window are two large tables arranged in the form of a T, and about these tables the teacher and perhaps twenty pupils can find seats. Up and down the middle of the tables are rows of the books to which reference will be made and some of which will be used for reading. To the right of the stage, still looking toward the large window, is a group of student armchairs arranged about a teacher's desk. On smaller tables are periodicals; and on the walls, bulletin boards bearing announcements of new books, book reviews, and the like.

CLASSROOM TECHNIQUE.—The selection of the pieces of literature for class reading and discussion is of course the point of departure. When the teacher meets a section at the beginning of a unit, he spends perhaps two or three class periods, with the pupils seated about the table, talking over with them reading in general—what they have read and what they like. Ideally, he also surveys their reading records all the way back to the beginning of the secondary period. In this fashion, he forms a rather shrewd notion of the reading tastes which have been formed. He is thus able to plan his technique intelligently. He selects the material for class use which he judges will best meet the situation, and he lays out his list of assigned reading. There is evidently here an analogy to the exploration step in the science type, the pre-test of the mastery formula.

A suitable piece of literature is thus selected for the initial presentation. The teacher tells why he selects it, why he thinks it will interest the class, what it is all about, and something of the story, its message and meaning. In a word, he motivates the class.

As is the case in all presentation especially, good control technique is imperative. The teacher is sure of his material, sure of himself, and convinced of the value of the piece. Otherwise, he may as well give up trying to teach literature, for he will not succeed. He keeps at the task, turning from pupil to pupil until he senses that he has in some measure succeeded in registering the message.

ORAL READING.—Part of the teacher's presentation may well be the interpretative oral reading of certain passages. Such passages are read without attempt at elocutionary effect, but forcefully and in a manner calculated to bring out what the author intended to get in his vocal values. Incidentally, an essential part of the preparation of a good teacher of literature is training in the art of reading aloud. If the teacher really feels the values which he reads aloud, however, he will be pretty apt to read effectively. There will be many opportunities, as the discussion of the piece goes on, when the teacher's reading will help to establish appreciation.

On the other hand, oral reading by the pupils themselves is an essential part of the process of awakening appreciation in many instances, and good oral reading for appreciation is hard to get, especially in the adolescent. The essence of the matter here is to avoid perfunctory reading. Perhaps the best plan is to call for volunteers to select passages for reading at the next meeting and to keep this process up from time to time until everybody has had his chance. Meantime, the piece as a whole has been read silently by the several pupils.

In a poetry course, probably most pieces used for class study will be orally read not once but many times. In a drama course, the pieces used for class study will be read orally by individuals in part, read as dialogue in part, and some of them will be assigned for dramatization. In prose courses, there will perhaps be very little reading aloud. Prose is not ordinarily written for that purpose. Nevertheless, certain passages frequently need to have their value brought out in that way.

It will not ordinarily be long after the teacher's presentation, in a class which is being conducted in a perfectly informal manner, before comments will be heard, and thus a discussion is precipitated. Now one of the most banal things in the world is a "class discussion" which has been planned and which is conducted in a cut-and-dried fashion. "Tomorrow we shall have a class discussion; class dismissed." The effect is disgust in the breasts of all but the lesson-learners, and they are proof against disgust. Purely spontaneous and natural discussion, however, opens many opportunities for the illumination which is the vital matter in awakening appreciation.

ASSIGNED READING.—At the most, only a few pieces in a literature course can be used for classroom study. Many others from the field with which the course deals are listed for assigned reading. Now, not only is the selection of material for the reading list important, but the nature of the requirement itself is critical. If the teacher assigns a limited list and requires the reading of the entire list, the result will be simply perfunctory covering of ground. If he assigns a minimum number of readings, the result will be much the same; the short pieces will be found to be popular. The appropriate procedure is to assign a sufficient list, to explain to the class its purpose, to get from them an honest effort in the light of a clear understanding on their part of what the purpose is, and then to guide and in some individual cases to constrain wisely.

Some of the reading is done outside the class, but much of it is done in the classroom. There will be some days when the class period cannot well be used for group study, others when circumstances appear not to make group study profitable, and others still when it is desirable to devote the whole period to silent reading. In any of these cases, a visit to the room which has been described will reveal a situation something like this. The group, as a whole, is absorbed in its reading. Some are gathered about the large study tables; others have taken chairs and selected places by one of the windows; several are curled up on the window seats.

The appropriate result of the reading periods and of out-of-class reading is the spontaneous contributions of individual pupils touching their own reading. As the class gathers about the table again, these contributions are offered and discussion follows. In practice, it is very noticeable that such individual reports operate as an effective "sales agency" with other pupils.

TABLE X*

Pupils	I	II	III	IV	Pupils	I	II	III	IV
1.....	5	0	0	9	19.....	8	2	1	2
2.....	10	7	0	12	20.....	9	4	0	2
3.....	4	3	0	0	21.....	5	5	0	0
4.....	4	1	1	3	22.....	4	6	0	0
5.....	5	1	1	4	23.....	6	5	1	0
6.....	10	11	0	0	24.....	13	5	0	0
7.....	9	3	1	0	25.....	4	0	0	2
8.....	6	7	2	2	26.....	4	0	0	2
9.....	6	4	1	1	27.....	9	6	0	6
10.....	8	9	2	0	28.....	6	3	0	4
11.....	5	No record			29.....	11	6	2	11
12.....	11	0	0	7	30.....	4	1	1	2
13.....	4	6	3	2	31.....	10	3	0	2
14.....	6	0	0	10	32.....	11	13	2	2
15.....	7	8	3	1	33.....	7	25	3	7
16.....	10	9	0	2	Total..	235	168	30	99
17.....	9	10	3	4					
18.....	5	5	3	0					

*I=No. of books from the classroom table.

II=No. of books of fiction read outside of class.

III=No. in II which are of equal quality with I.

IV=No. of newspapers and magazines read regularly.

Each pupil keeps a card record of the books read, with such comments as he cares to make. If his comment is limited to "I liked this book pretty well," the card is returned with the request that he record the reasons why he liked it—or perhaps did not like it. Here, as in the free reading, the books of the reading lists not only supply assimilative material but the pupil's record is the best evidential material we can get of the appearance of the true learning product, of his own growth in appreciation, or perhaps of his failure to grow. Table X, taken from a current work report, shows the use of the silent-reading record for the purpose last named.

The pupils in this section were almost entirely children who have had no genuine background in good reading either in the elementary school or in the home. The record is more illuminating when studied in connection with the following quotation from the report which is also evidential material of weight.

For the first two weeks or more [of a twelve-week period] some were restless if their reading continued throughout the class period. Their attention was easily caught by movements in the room or hall. The boys are for the most part at the rowdy stage of early adolescence and they were inclined to disturb each other. Toward the middle of the quarter a noticeable improvement was observed, and toward the end of the quarter the attention during such periods was almost perfect. The pupils began to read at the opening of the hour without being called to order and some always stayed after the close of the hour as long as possible.

An average of eight books in the field of the course were read during the quarter, seven of them during the silent-reading periods in class. That is a good beginning for the type of pupil background available. Of the five books read out of class (free reading), one was of as good quality as those read in the classroom. There is a beginning of transfer, of the building up of the true learning product. In the cases of Pupils 8, 10, 13, 15, 17, 18, 29, 32, 33, there is evidence of actual effect of the course. In the cases of 1-3, 6, 12, 14, 16, 20, 21, 22, 24-28, 31, there is no such evidence, but in the cases of 2, 6, 12, 16, 24, 31, the record shown in Column I is favorable.

In a class of pupils, who are one and two years older in school, a similar record shows 65 per cent of the free reading to be of good or excellent quality.

LIBRARY REQUIREMENTS.—All the foregoing implies the collection of a working school library. Here, as in the science type, one of the major objectives is to learn how to use books in the place of learning how to con textbooks. It seems strange that in this day of expensive and even extravagant school buildings, school boards should be so reluctant to provide the adequate and essen-

tial working tools in the form of working libraries. Perhaps it is due to the fact that most school boards are "textbook educated." Perhaps the worship of sacrosanct library shelves and card catalogues has something to do with it. Be that as it may, it ought not to be necessary for high-school English teachers in important city high schools to raise money by popular subscription for the purchase of needed book material, however much we may admire the energy and capacity of the teacher who has done it.

For each of the units listed above, there are needed many pieces of literature for the assimilative material, enough so that there is wide liberty of choice for the pupils, enough so that many pupils can be reading the same book at the same time when a particular title proves popular. A school library which consists of single copies of works needed for classroom use carefully acquired, stacked, and to be used only on a withdrawal card is not a working library. Books needed for classroom use should be in the classroom for use. Under suitable control, there should be a steady flow from the main library stacks to the classrooms and back again, as lists of books are needed and as the need ultimately ceases.

WRITING.—Literature is the English department's content subject. We have seen at some length the importance and significance of English writing in the content subjects of the science type. Here, no less than there, the content of the course furnishes the foundation for practice in writing, and conversely writing tends to generate assimilation of the course content, so far as perception of meaning is a part of the learning product. Only, the writing must never be allowed to degenerate into perfunctory performance. With the controlling principles in mind, the ingenious teacher will find many opportunities for productive writing suited to the needs of the different individual pupils. In general, however, three kinds stand out. Probably all pupils should have some experience with the first two and as many as possible with all three.

BOOK REVIEW.—The book review, adequately conceived, seems still to be a useful form of writing. Now the perfunctory review conceived chiefly as an exercise to enable the teacher "to be sure that the pupil has read the book" is of course worse than useless, and it has deservedly fallen into ill repute. Before setting the senior-high-school pupil, and sometimes a junior-high-school pupil, to the task, the teacher should explain to the class the nature of a good review and acquaint them with several instances. In fact, they should become accustomed to the use of book reviews, as a part of the work of every course in literature. The pupil should understand clearly that, before he undertakes to write his review, he should become thoroughly familiar with his book and not begin to write until he has reached the point at which he feels that he has something to say. Obviously, he should be allowed to select a book which seems promising to him. He will need a generous time allowance, not simply the admonition, "Write me a review of ——— for tomorrow." The review, when submitted, should be always a creditable piece of work, for content, for composition, and for English usage. Re-writing one or more times, wholly or in part, may be needed. In the end, such reviews presented to the class contribute, not only to enlightening the class as to the manner and method of such writing, but very often they contribute illumination of literary values and stimulate the other pupils to further reading.

CHARACTER STUDIES.—The character study, again properly conceived and carried out, is a serviceable instrument of study in a literature course. When conceived as a perfunctory exercise in which an immature pupil endeavors to grapple with a character development which is far beyond his capacity, of course the performance is a farce. A technique for developing character study has been carried out in the University High School, with seemingly productive results, somewhat after the following manner.

A pupil exhibits some intelligent interest in a character. Lady Macbeth, for instance, seems to possess a fascination for many

high-school pupils. The teacher responds, "Very well; would you like to make a study?" The pupil is then warned that the task will require lots of hard thinking, that a series of paragraphs beginning "I think" will hardly do, and he or she is set to work. The pupil studies his problem and works up his successive points on a series of the ever useful 4×6 cards, citing passages. These cards are then submitted to the teacher who examines and criticizes the content and suggests lines of further study to be carried out, probably in a silent-reading period. When the assembling of material seems to be sufficient, the pupil is allowed to begin writing. From that point forward, the technique corresponds to that used in the supervision of a book review.

CREATIVE WRITING.—A third type of writing is one in which the pupil himself essays some modest creative work. This type is of course especially available in various forms of lyric poetry and in the short story. It could probably be developed to a considerable extent in many high schools, for there is a great deal more potential literary talent among children than we are accustomed to think. Obviously, the purpose here is not primarily to develop such talent as may be found but rather, first, to utilize some creative writing as one of the lines of access to appreciation; and, second, to further the process of training the pupil in the art of expression. Experience seems to show that the pupil who himself essays the art of literary expression tends to acquire a new attitude toward the material which he reads. It is one of the several methods of productive study in the field of appreciation.²

THE VOLUNTARY PROJECT.—In the appreciation type in general, and in courses in literature in particular, there are found individual differences among pupils just as such differences manifest themselves in all subjects. There are, on the whole, perhaps more such differences here than elsewhere, for, as we have seen, courses in appreciation cannot be made determinate to the same extent as courses in other types of teaching. We are par-

² See, however, p. 95 and p. 354 for limitations and misconceptions.

ticularly concerned with pupils in whom appear cultural interests in the type of material which they study and whose capacity for present growth goes far beyond anything of which others are now capable. Hence, the voluntary project in teaching. Fruitful fields in which such projects may be found can be seen in the enumeration which follows.

On the whole, perhaps the most available is the study of some particular author as he is revealed in his works. Such an undertaking will often call forth interested study for weeks at a time, and the end of it all is a production which is usually a creditable piece of work. On the other hand, if the pupil is in reality seeking some commercialized reward for a voluntary undertaking, either a superior mark or perhaps a reward at home, he is likely to confine himself to "reading up" about an author. He explores the pages of an encyclopedia and perhaps the introductions to the author's works for biographical notes, and the result is the more or less perfunctory schoolboy "composition" or "written paper."

A very common form of voluntary project is the extended attempt at literary production. Of course, pupils who have no discernible talent in this direction should be steered into other fields, but potential talent not infrequently does appear, and pupils who seem to possess it may well be encouraged. Some of the productions in the laboratory have been extended epics, plays, and in one case the libretto for an imaginary opera.

Pupils whose bents are otherwise than these sometimes exhibit and express their interest either in practical-arts channels or in pictorial representation. Illustrations are found in the design and arrangement of stage settings, including the electrical accessories, and in serious attempts at illustration in color. Some of the girls who have acquired an interest in costume from their domestic-arts courses utilize their attainments in studying the descriptions found in works of a given period and in preparing sets of sketches illustrating the period.

Now and then a pupil is found whose interest is purely intel-

lectual and whose voluntary project runs in the direction of historical study.

Altogether, any subject which is germane to a unit will serve and any paper may be accepted provided there is evidence of genuine interest, serious and prolonged study, and painstaking endeavor to produce a worthy result. Pupils should not be allowed to feel that failure to undertake a voluntary project constitutes a reproach. Many of them will be fully occupied with projects in other subjects.³

V

THE PROBLEM CASE.—After all, there are pupils, even under the best of conditions, with whom we seem to make little progress, and these become the problems for individual study. The difficulty may reside in causes which are general in character and which are treated in chapter xxx. On the other hand, the pupil may be and frequently is a problem in literature only. We do not seem to be able to reach him. In such cases, the cause is apt to lie somewhere within the field of the specific apperceptive mass. He does not respond to the course in literature, simply because he has an inadequate ideational and appreciative background. Corrective treatment consists in providing some basis from which contacts can be made. The case cited above (p. 365) was such. If the free reading has been adequately guided, such cases will be the less likely to appear. Nevertheless, even when they do appear at a relatively advanced level in the secondary school, they can usually be set right. There comes to my mind a boy who is perhaps as obstinate a case as is likely to be encountered. Afflicted by an obscure and peculiarly mortifying physical malady, classed as "dumb," and more or less the butt of his fellow-pupils, his reading inclinations had scarcely passed out of the infantile stage. And yet after two years in general literature

³ An excellent description in detail of the use of the voluntary project in literature can be found in Miss McCoy's article entitled "The Voluntary Project as a Measure of Appreciation in Third and Fourth Year English," *Studies in Secondary Education*, Vol. II. Chicago: School of Education, The University of Chicago.

and patient and intelligent appeals on the part of his teachers, the work reports show a distinct awakening to the appeal of the materials of the course in which he is now enrolled. Should such pupils receive "credit" for the course? Nowhere is this counting-house term so essentially meaningless and fraught with such mendacious implications. There should be no question of credit. Rather should the attitude of the school be, "Now, James, you seem to be 'catching on' and I think it will be worth your while to come back to me next year. Frank and Mary are going to take the course again and George Blank, who you know is in the junior class, is going to be with us." "But, will I graduate?" "Never mind graduation; that is a long way off yet. If you really try as you have this year, you will graduate all right, and you will be ready to graduate."

Related to the defective apperceptive mass, as the factor explaining many problem cases in appreciation, is the influence of the materialistic home and social group from which the pupil comes. The latter encounters a group opinion which is decidedly averse to anything which is under the suspicion of being "culture." Comment on one such typical case recites that "_____ resents anything written more than five years ago in his obsession that it is not 'up-to-date.'" The motivation lying behind this attitude in the home is probably what is sometimes called "inferiority compensation." The parents who are acutely conscious of their own actual achievements, usually in the field of easy money-making, are also conscious of inferiority in the social scale. They do not fit the station to which they had supposed money was the ticket of admission. Vaguely conscious of the lack of something which they generalize as culture, they compensate by decrying everything which to them savors of culture. The child thus becomes adjusted to a perverse social standard. To him reading a classic falls in the same category with the inappropriate use of one's knife at table. It isn't done. The corrective treatment here is discharge of the attitude by making the

pupil conscious of its existence. When the right moment arrives, a conversation something like the following occurs.

TEACHER: You do not seem to care for such books as ———. Now, most of the class seem to enjoy them.

PUPIL: Oh, I hate all that stuff; it isn't up to date! What do I care about something that was written a hundred years ago! These other kids are sissies and highbrows. John doesn't like it any better than I do.

TEACHER: Frank likes it. Is he a highbrow [football player]? Judge Blank was talking to me about some of these books the other night. He and Mrs. Blank were reading [one of the books on the book table] when I called there. [The Blanks are much looked up to by the boy's parents and he knows it.]

PUPIL: Oh, well.

TEACHER: Now, William, I am going to tell you something that will surprise you. You really wish that you could enjoy these books. You don't enjoy them because you won't make the effort to. And so you comfort yourself by this cheap talk about highbrows and being up-to-date. A great many people find something in the books, and that is why they are still printed. They were printed a hundred years before you were born, and they will still be printed a hundred years after you are dead.

The conversation may likely sink in and bear fruit. If the home influence is still too strong, we shall try it again later on. Meantime, the teacher will feel his way with other books, perhaps better calculated to meet William's case.

Attacks on (1) general factors which produce problem cases; (2) the defective apperceptive mass; and (3) the adverse public opinion of the pupil's social group will clear up most problem cases. There remain obscure factors which must be sought in painstaking exploration of the case history, if corrective or remedial treatment is to be successfully applied. It may or may not be true that certain traits which operate as true instinctive tendencies stand permanently in the way. We do not know. We do know that there are numerous identifiable and removable obstacles which should claim the school's attention.

IN FOREIGN LANGUAGE.—In bringing our consideration of English literature to its close, it is worth while to anticipate a later chapter (chap. xxiv) and to point out that the foreign languages, both ancient and modern, have literatures of their own, which are available for the purpose of the appreciative development of the pupil. It is a pity to use Vergil and Cicero or Goethe or Victor Hugo as mere exercises in reading, for which they are illy adapted. They should be used, rather, for their proper educational purpose—the awakening in the pupil of new senses of value and the expansion of that stock of values which he acquires in the literature of his mother-tongue.

VI

ANALOGIES IN MUSIC AND OTHER ARTS.—Space does not permit the extended treatment of other subjects belonging to the appreciation type which we have given to literature. In the process of education they are not less important. Good reading is accessible at any time, and in the public libraries it is accessible to anybody. Good music in these days of mechanical players and the radio-telephone is only less accessible. We have chosen literature as our type subject, both because it still, on the whole, furnishes the most accessible environmental contacts and because it has established its place in the school.

In each, there is the foundation of abundant contact with the best the world has to offer which is adapted to the several levels of pupil maturity. In literature, we get this contact through the free reading. In music we get it through the pupil's experience with music which has been committed to permanent form. In painting, architecture, and sculpture, we get it through representations in photographs, of which every school should have a liberal and growing stock.

In courses set apart for learning in appreciation, the principles which we have discussed in the case of literature apply to the other arts as well. They apply to the rationale of organizing

and conducting courses as truly as do they apply to the technique of teaching.

In the latter, we should find in each course: (1) the principle of exploratory testing and the selection of material best calculated to come into apperceptive sequence with the pupil's existing level of appreciation; (2) the principle of illumination of the field at the hands of the competent teacher; (3) the principle of class discussion calculated to bring out the attitudes of the several pupils and to contribute to the group attitude the reactions of individuals; (4) the principle of individual reports on music heard or examples of art seen; (5) the principle of notation of results by observation of unsupervised preferences of pupils; (6) the principle of voluntary projects; and, finally, (7) the principle of study of problem cases, and, so far as it is possible, correction of the same.

CHAPTER XX

RIGHT ATTITUDE TOWARD CONDUCT

IN THE present chapter we enter that field which used to be cultivated in the books which discussed discipline and school management. The task of developing right conduct and maintaining discipline was commonly felt and probably still is felt to belong peculiarly to the administration. Not so. The school in its influence upon the pupil is a unit. The primary duty of the school principal in this field is to organize and to direct the influence of the school. In a small school, he may in addition be the personnel officer. But the problem of developing the pupil into the right adjustments in conduct is as much the task of every teacher as it is the task of the principal. It is an instance of teaching in the appreciation type.

I

THE LEARNING PRODUCT.—Attitude is emphasized rather than outward behavior. The adaptation or true learning product is an attitude and not performance. It is true that we must seek in the child's behavior for the evidences of changing attitude, but we may have good behavior with no positive attitude at all. The confusion of behavior with attitude arises from the same kind of misapprehension which we have found elsewhere in the confusion of classroom performance with learning. The good boy who never does wrong may be as truly the lesson-learner in conduct as his fellow who always scores high on the daily recitation but fails in application. Common experience, as well as the literature, is full of instances in which the typical well-behaved high-school boy, and high-school girl as well, have broken down badly after leaving home and the local school and entering upon the unrestrained life of the college community. In other cases, those of most of our

boys and girls we hope, conduct stands for right attitude, just as their records of lessons well learned are found to correspond to the attitudes of intelligence, or the attainment of proficiency in certain arts, which such lessons are presumably calculated to bring forth. We shall then use the term *conduct* to mean right behavior founded on right attitude.

Right attitude, of course, appears as sense of duty, honor, courtesy, fair play, religious obligation, willing obedience to lawfully constituted authority, and the like. It is perhaps summed up in the expression "inclination to do right because it is right," entirely apart from policy and from hope of reward or fear of punishment. The result of normal and successful development in the pupil is simply a part of the normal structure of civilized mature personality, as distinguished from infantilism on the one hand and the vestigia of savagery on the other. Essential failure in conduct is therefore evidence of either immature or else perverted personality, much as arrival at physical maturity without the multiplication table is evidence of intellectual infantilism.

NOT MORAL BEHAVIOR.—Nor is right attitude toward conduct, or a mature personality, to be confounded with morality. An individual may be entirely mature in his conduct structure and still at times be woefully lacking in the quality of his moral behavior. On the other hand, it is probably doubtful that anybody ever does live a consistently moral life, apart from the maturity of his conduct attitudes. Morality implies external social adjustment, awareness of the *mores* which appear from time to time in evolving society plus a sense of obligation or moral sanction. Morality, critically defined, changes from age to age. We have left behind some folkways which were once thought to be essential to living together in society, and probably were essential, and we have added many others which the greater complexity of modern life requires. But the conduct attitudes of civilized man are the same in all the ages, at least so far as we can know

what they are. The other day, I saw a line of street cars carrying the legend "Cutting in is a sin"—referring to the irritating and dangerous practice of driving an automobile out of line in traffic, in order to pass cars ahead—and so it is a sin, a new one. Nevertheless, the admonition will be read with blind eyes unless the reader is actuated by the conduct attitudes which we call *fair-play*, and *regard for the rights of others*. These conduct attitudes were as basal to civilized life in the sixteenth century as they are in the twentieth. Apart from them, there is no civilization or else an undeveloped civilization.

NOT ETHICAL JUDGMENT.—Nor is right attitude toward conduct a matter of ethical judgment. What is objectively right is one thing; inclination to do what is right is quite another. The materials for ethical judgments arise out of the sciences, out of the stock of human wisdom which is collected in the best literature, out of the common experience of life, out of the principles of ethical thinking organized as a science. But all the ethics since Confucius is worthless in education, apart from conduct maturity. Chemistry and biology seem a far cry from ethical training, but we sometimes have occasion to say of a noble character, "How he would revolt at that act, if he only knew what it is doing to other people!" One reason why we are so far from perfect resides in the fact that we are so ignorant. That is excusable. But it is an inexcusably maimed and vicious personality which is infantile or barbarous in conduct in adult life.

CONDUCT AND LEARNING CAPACITY.—As data accumulate in the field of pathological learning and in the field of clinical abnormal psychology, it is strongly suggested that learning capacity, sanity, even mental capacity itself, are often founded in an important sense on conduct. Learning is so much a social and volitional affair, both in its objectives and in its processes, that characteristics which seem obvious instances of organic mental incapacity may well be, and indeed frequently are, more accurately to be understood as retardations in conduct.

II

THE MECHANISM AT WORK.—The normal child, healthy in body and mind, starts his career possessed of a protective trait which we call variously self-assertion, self-esteem, or just plain selfishness. He would not be here at all had not his ancestors long ago developed this trait. Nearly all the qualities which constitute civilized conduct represent in one form or another the end results of a series of personality adaptations through which the raw individualist whom we meet as a child is transformed into a social unit who has not in the process lost his self-hood. Self-esteem has become personal dignity. The satisfaction which once came through mere self-assertion now appears as self-respect for duty done, honor gratified, fair dealing rendered.

SUBLIMATION.—The developmental process going on is called *sublimation*, which means simply that a higher and ordinarily opposite kind of satisfaction comes to take the place of the original infantile or primitive satisfaction, the organic stimulus remaining the same. The most common example is perhaps to be found in emergence from the universal childish egoism into the normal altruism of mid-adolescence, which is discussed below. Both in the child and in the adult the drive is self-esteem, but in the former the outcome is utter disregard for the rights of others, while in the latter trespasses on the rights of others produces feelings of dismay and shame. Again, we all of us come to experience disgust at acts which once gave us satisfaction. We have passed through a sublimation process.

Sublimation and rationalization are apparently parallel and equivalent processes in the evolution of personality. The first constitutes the adaptive process, or learning process, in appreciation and especially in conduct, while the second serves the same function in the evolution of the attitudes of intelligence.

REPRESSION AND SUPPRESSION.—Now the process of sublimation cannot start at all apart from the blocking of the primitive

urges, which largely cluster about self-assertion, the gratification of animal impulses and, in general, self-indulgence. One occasionally finds young adults who exhibit all the characteristics of upper-grade imbeciles and yet are in no true sense mental defectives at all, but only examples of individuals in whom the sublimation process has never had any chance whatever to work. They have been systematically spoiled since early infancy. Curiously enough, such people could probably not be found outside of civilization, for under primitive conditions they would be eliminated in the struggle for existence.

Let us call the process of blocking *suppression* when the control comes from outside and *repression* when self-control is exerted.¹ Hasty inferences drawn from the study of abnormality have in recent years made both these terms take on a sinister meaning, as if they were both instances of pernicious activity in parents and teachers or in the individual concerned himself. Hence, "Let the child have his own way" and "obey that impulse" are thought by some literary folk to be the precepts of civilization and sanity, the disclosures of the "new psychology." Such precepts are singularly attractive to undisciplined people, especially when the latter possess the material means of boundless self-gratification. If the reader is fearful that his "repressions" may have led him into mental ill-health, let him cheer up; most people are more likely to go crazy for lack of repression.

Of course either suppression or repression may be unwise and lend to morbid conditions. So may eating or even breathing and certainly drinking. In general, both have probably unwholesome tendencies when sublimation either does not or cannot take place.

¹ The critical reader is warned that these terms are employed in a sense which seems to me to be appropriate in pedagogical as distinguished from psychological thinking, although the present use is not altogether arbitrary. The psycho-analysis school seems to use the two terms without much real difference in meaning and the meaning is the exclusion of ideas or desires from consciousness under the action of the hypothetical censor. Repression here implies a more or less voluntary process and suppression the opposite. An equivalent use appears in physiology. See also English, *A Student's Dictionary of Psychological Terms*.

Specifically, suppression which represents the purely arbitrary self-will of parent or teacher or which is drawn forth on all possible occasions in the process commonly called nagging is harmful, but it is harmful chiefly because it renders the pupil less likely to respond to constructive suppression. An everlasting succession of "don'ts" directed to whatever the child's activity may be is undoubtedly mischievous, but that is no reason why positive and insistent prohibitions directed to potentially vicious child activity should be placed under the ban. Perhaps the most definitely harmful kind of suppression is that which tortures the pupil, or even young people who are older than school children, out of natural self-esteem and confidence. The effect here is harmful, not because the pupil is rendered indifferent to any and all kinds of admonition, but because a positive conduct perversion in the form of cowardice and timidity is set up. These are of course only examples of baneful suppression. The number might be multiplied at length, but still the range of wholesome and wise suppression exerted by the sensible parent or teacher or school is very much greater than the range of harmful suppressions.

Repression is of course seldom exerted by young children, for the simple reason that a considerable period of parental or pedagogical restraint must elapse before the growing child is conscious of any such requirement. As time goes on, however, most of the conduct attitudes come to depend upon the repression of undesirable tendencies until the point is reached for each at which sublimation has taken place. For example, in what seems to me to be probably among the first of the conduct attitudes, namely *deferred satisfaction*, the child must for a long time repress his inclination to immediate enjoyment. The time comes, however, when the latter becomes positively distasteful and the sublimated attitude may even become hypertrophied. In other words, the child becomes a little miser.

The harmful repressions are more likely to occur in adolescence or in adult life. Like the harmful suppressions, their pathological character arises out of the principle that sublimation is

either unsuccessful or impossible. In adolescence futile repressions may be set up, purely on account of lack of enlightenment over some physical or social condition. Obsessive fears or anxieties may be the occasion of noxious repressions or conversely may be the outcome of the latter. The subject is a large one, and adequate discussion would require an extended treatise in mental hygiene. The point for us to note is the principle that repression in itself is a normal and not an abnormal mechanism in the process of civilization and that normally developing pupils may be expected to exercise a great deal of repression. Oftentimes we older people are unable to escape and unable to achieve sublimation; apart from medical or spiritual help we have to suffer for the sake of other people.

III

THE LEARNING UNITS.—The basis of conduct is then to be found in the normally developed and integrated personality, the individual who senses his place in the scheme of things, accepts the results, and has become capable of self-control and self-direction. Where shall we find the units which enter into such a personality structure?

The obvious thing seems to be to turn to examples of successful living and list the traits which we find. The trouble is that there is an unmanageable number of traits. Furthermore, we have only the most subjective sort of definition of successful living and at that we have only our individual unsupported judgment of the extent to which conduct enters our definition. It is futile to turn to a consensus of opinion, for a thousand unreasoned estimates are no better than one such estimate. Finally, it is at best exceedingly difficult to avoid mistaking symptoms of different kinds for the conduct attitudes themselves, such symptoms as refinement, cheerfulness, patience, courtesy, docility, and literally hundreds of others. We shall return to the point in another connection.

Perhaps we can make some progress by following the method which the study of the physical organism has always followed,

that is, we may study the pathology, the individuals who seem to have gone wrong, and the primitives, the people who have never learned to go right.

There has grown up in recent years a respectable body of literature dealing with the study of maladjusted young people. A large proportion of the case studies which constitute this literature, it is true, have grown out of court experiences and the records of institutions maintained for the treatment of personal maladjustments which have passed into the field of actual abnormality. Nevertheless, there remains a great body of material which deals with the maladjusted child who has not become a delinquent in the legal sense and has not passed over into a state of positive abnormality. These are the educational cases. As we survey this literature, certain characteristics of the maladjusted appear with marked frequency. We cannot doubt that the corresponding positive adjustments stand in great part for the normal, integrated personality which is the basis of conduct.

Again, the anthropological and sociological literature contains many intimate accounts of the behavior of peoples who by all reasonable tests must be accounted uncivilized. If we try to sort out the striking points of difference between uncivilized and civilized man, we shall find them to be very much in harmony with many of the characteristic differences between young people who show normal conduct development and those who are recognizably examples of arrest.

We thus come out at a reasonable list of items which seem to be comprehensive and significant. In other words, we find our conduct units.

The list which is presented below represents no attempt to arrive at finality. It does seem to be well founded so far as it goes. It might probably be somewhat extended, but it is doubtful that even the most careful and prolonged study would extend the enumeration into the hundreds or even into the scores. The list is not necessarily to be taken as a recommended order of establishment in the pupil. It is not an illustration of the culture-

epochs theory. Obedience, for instance, is relatively late in racial evolution, but that is no reason for deferring it in the pupil. On the contrary, it is probably the first in point of chronological priority.

1. *Deferred satisfaction*.—One of the most striking differences between the savage and the civilized man is the capacity of the latter to postpone immediate trivial satisfaction in favor of greater satisfactions or in favor of the later avoidance of misery. The savage in the presence of an abundant food supply, unprotected by the blind instinct of some of the lower orders, delivers himself to a period of gluttony and, in the subsequent period of scarcity, starves. People who have reached a somewhat higher stage of human evolution have acquired a more favorable attitude; they store the products of seasons of plenty. The truly educated youth refrains from spending the product of his labor upon his present pleasure but rather saves for higher satisfactions in later years. The child who is born into the comparative luxury of most modern American homes, and the paternalistic oversight of the modern state, shows a marked tendency to revert toward the characteristics of his ancestors. He must have his pleasure and have it now. Reasoned with, his rejoinder is, "I know I want this thing; how do I know that I shall want something better later on?" Materialistic hedonism this, with a vengeance! The youth is lacking in one of the most primitive and fundamental adjustments, and the adjustment is one of right attitude and not one of intelligence. His response reveals acute intelligence as a matter of reasoning on the basis of experience. With all such, learning is only through actual experience, and unhappily by the time experience is gathered it is often too late to mend. The essence of teaching is to provide the growing pupil with experience out of which he can learn and guidance and constraint in the direction of learning—school savings banks for instance.

2. *Sense of consequences of own acts*.—A little noted characteristic of immature children, and of primitive peoples, as well, is found in the fact that they do not sense that their own acts have

inevitable material and other consequences. Among primitive peoples, the trait is sometimes found in amusing circumstances. It is very common among problem-case pupils, sometimes even at college level. It is not infrequently a mark of semi-civilized adults. The child blames his playmates for his mischances, or even inanimate objects. The primitive sets up a hierarchy of evil spirits and witches. The immature adult lays the fault at the door of the political party in power and to legislation which happens to be recent.

Note the rather obvious connection here between conduct and mental capacity, or at least learning capacity. "You have nobody but yourself to blame," is the inexorable admonition of parent and teacher from an early day in the pre-school.

3. *Altruism*.—To enumerate here merely the virtue of unselfishness would be to proclaim the obvious. The matter apparently goes deeper than that. Normally, the developing child evolves out of a profound egoism into an attitude in which such egoism seems to him contemptible if not repulsive. Prior to the adaptation, the world seems to exist for the sake of gratifying his desires. If his desires are not gratified, he can interpret the situation only as an incomprehensible injustice which he resents as vigorously as his own powers and the patience of the older generation make possible. It apparently seems to him incongruous that he should put himself out, even in the slightest degree, for the convenience of others. Under normal upbringing, most children sooner or later pass into the normal adult attitude in which it seems as natural and as fitting to serve the convenience of others as to serve one's own convenience. The thought that he has on occasion ruthlessly enforced his own convenience to the deprivation of others now causes an emotional reaction of shame. He has thus passed through the normal altruistic adaptation.

Two forms of arrested development here are easily identified.

Cases are sometimes met in which the child has never actually made the primary adaptation. He has grown into adult life, arrested at the infantile stage, in which the all-sufficient explanation

of desire seems to be "I want it." The causation which lies behind this type of arrest is typically an indulgent and influential home, a relatively weak school, or at least a school which is unable to assert itself against the home, and a child who is physically able to become a bully. These cases of arrest at the infantile stage are apt to become criminalistic in later adolescence. The attitude toward conduct apparently is, "Blank stands in my way. I hate him and will kill him. My father will see me through as he always has." No question of the rights of others inhibits, for they are no more parts of his conduct structure than they were when he was a lusty three-year-old. One such case known to the author in its end result, and intimately studied and reported by one of his students, has become a penitentiary case on a manslaughter conviction, which probably ought to have been murder. The case history runs precisely true to the type which we have described, with the single exception that the boy would not have been able to play the rôle of bully but for the infatuated domination of the whole local situation by a masterful father. The young street bully of the slums shows the same type of arrest, and we find him later as the gun-toting thug of the underworld.

Much more frequently, of course, arrest takes place at the childish level. At that level, the child has learned to conform, but he has not passed through the adaptation in which the attitude takes on the characteristics of genuine altruism. He has his own way regardless of the rights of others so long as he sees no reason to fear consequences unfavorable to himself. The end result is the profiteer—in commerce, in politics, in ordinary social intercourse, even in academic life.

It seems to be important to emphasize the point that the altruistic attitude is the normal attitude in the mature individual, at least in the civilized races, and that the crass egoism which we so often encounter is essentially a manifestation of arrest in personal development. A heavy survival value was long ages ago placed on the inheritance of the tendency to learn self-sacrifice. Otherwise, the lengthening period of infancy, and its basal effect in the

evolution of the human individual, of the family, and of society in general, would have been impossible from the beginning. Hence, apart from freaks in genetic succession and the survival of unfit stocks, we all of us inherit tendencies which normally ripen into altruistic attitudes toward conduct, provided we are taught.

4. *Sense of fair play.*—Intimately related to the altruistic adaptation, possibly an implication of it, and at any rate a unit learning in conduct, is that foundation of justice between man and man which we may call "sense of fair play." At bottom, it seems to be willingness to accord to others what is their own, to do as one would be done by. Even the small boy finds it reasonable to proclaim, "That is not fair." The most he needs, apparently, is progressive refinement in his attitude and habitual application to widening sets of experiences. Only there must be present both guidance and enforcement. In brief, justice requires a judge who can interpret and apply and who is himself fair. It goes without saying that, as soon as the child becomes a member of a social group such as is found in the school, innumerable occasions arise in which there is abundant assimilative experience. Especially is this true of the playground. But the pupil's dawning sense of fair play is quickly aborted unless there is present the means of interpretation and enforcement. To set up a playground and complacently assume that the sense will rapidly evolve is like assigning lessons and expecting education to result. Without enforcement, the bully soon dominates and the pupil makes up his mind that being fair is not part of the scheme of things. He tends to become himself a bully, or a wire-puller, or a slave, as the circumstances decree.

5. *Property rights.*—There is no fair play and no justice apart from discrimination between mine and thine. I do not refer here to the civil institution of private property merely; that is only a feature of a broader relationship between individuals in society. Neither young children nor the most primitive peoples seem to have the trait as a part of original nature; and the insti-

tution itself, the right of adverse possession, is a comparatively recent development, so recent in fact that we have not yet learned fully how to manage it. The infant has an acute sense of mine but not of thine. And yet civilized existence, both in its system of rights and in its system of obligations, rests upon sense of property perhaps as basically as upon any single element in its foundations. It extends not only to material possessions, but to rewards and emoluments, to husband and wife and child, to life itself either of humans or the lower animals—and in brief to respect for the selfhood of other individuals. The individual who lacks the sense, as many do, can most accurately be looked upon by the student of education as an example of arrested development; in other words, he is what the infant or the primitive barbarian is. If he is strong he becomes an exploiter. If he is relatively weak, he suffers continuous emotional upheaval because of his inevitable external conflicts with other people.

Curiously enough, stealing is not necessarily evidence of absence of the trait, although absence is of course likely to result in stealing. Stealing, which turns up periodically as a high-school trouble, is apparently more often an instance of a semi-neurotic condition in an immature and as yet unbalanced personality.

6. *Spirituality in the sex relationship*.—In the process of building right conduct, we encounter the problems presented by what the poets call the “master-passion.” A large percentage of the youthful conduct cases which come to the various clinics are related in one form or another to matters of sex. In dealing with such, we are prone to consider the sex-hygiene aspect, and the physiological problems involved, and rest there. Perhaps that is the first thing, and, it may be, the only thing to do with cases which have developed to a pathological end result. In neither aspect, however, do we get to the root of the matter as far as the educational problem of developing right attitude is concerned.

As man has evolved from the lower stages of savagery, in which he differs little from the lower non-human forms—and that difference not always to his credit—he has tended, as we

have seen, constantly to intellectualize or rationalize those aspects of his environment which are capable of being so treated and to sublimate or spiritualize those aspects which are incapable of rationalization. On the whole, the latter process seems to have been one of adjustment in which successful adaptation had a marked survival value. Personality tended to evolve along that line. Food supply was more or less determinate and capable of rationalization. Man's next most powerful driving force was not susceptible of that form of adjustment. Accordingly, he endeavored to spiritualize it and to adopt the results into his most highly organized attitudes toward conduct. The Iroquois, for instances, surrounded the sex relationship with a code of superstitious sanctions, so much so that in the whole history of their fiendish treatment of captives, there are few known instances of violation of females. The kindred Hurons on the other hand lived in beastly and brutal promiscuity, but they went down hopelessly under the assaults of the Five Nations. Other primitive peoples founded religious rites on the instinct, and, albeit the result seems often to have been perverse, nevertheless we note the characteristic tendency. Similarly, civilized man in his best periods has spiritualized the sex relationship, and the result has been some of the noblest cultural documents and monuments of the race. In his individual attitude he has surrounded it with what we commonly call reverence and modesty.

Especially is it true that in the long ages in which woman has been slowly winning her way to spiritual equality with man, and escaping the status of a mere chattel, the process has been one of the exaltation of womanhood in the attitude of man. There have been innumerable retreats, but in most of them, as the record comes down to us, women have thrown away with lavish hand all that womanhood has gained.

We can draw a contrast in attitude. On one side is an attitude in which the love of the sexes is felt as perhaps the supreme manifestation of beauty, calling forth the emotional reaction of reverence. On the other is an attitude in which at best it is viewed

simply as a set of biological phenomena, containing certain warnings perhaps, and at the worst as a common and sordid thing, valuable chiefly as a source of physical satisfaction or of economic support. Which is the attitude of educated manhood and womanhood there can be no manner of doubt. One attitude belongs to man in what we recognize on other grounds to be his highest development; the other belongs to man in his most primitive savage condition. Evolution is irreversible, but individual reversion to primitive types is always possible.

The objective here then is an attitude toward conduct in the normal boy and girl in which love is viewed as a spiritual thing and not as a purely physical or at least materialistic piece of human experience. The outcome is not merely chaste conduct, but, more than that, a contribution toward that complex which we call normally developed personality. Chaste conduct is undoubtedly an essential piece of evidence touching the existence of the attitude, but so is modesty, taste in personal adornment, willing reverence toward womanhood in the man, exaction of respect for her womanhood in the girl, and refusal on her part to adopt masculine conduct.

7. *Right acceptance of criticism.*—In the literature which deals with conduct cases, and in unpublished case studies, one very frequently meets with the verdict, "Cannot accept criticism; makes every criticism a personal matter." In such instances, we encounter symptoms of arrest at an infantile or childish age of self-esteem. The reaction is normal in the child, perhaps throughout the preadolescent period. His typical rejoinder is "Good gracious! why are you always picking on me!" But he accepts criticism as the prerogative of the adult Olympians and, if it is firm and resolutely followed up, mends his ways and makes some progress toward the normal adaptation in conduct. It is apparently at this stage that the mischief is apt to be done by parental and pedagogical spoiling. Criticism is not followed up by insistence on right conduct. Even worse than spoiling, perhaps, is nagging. The parent or teacher fails to real-

ize that the perverse attitude has its roots in natural self-esteem and persistently endeavors to incorporate in the child's attitude what is after all little more than idle notions taken from the adult's attitude. The latter is not content that the child shall do right; he prefers that the child shall do right in the adult's way. If continued into adolescence, we are very likely to get the definite set against all criticism which is characteristic of the perversion. In the adolescent, the perverse attitude begins to be pathological and, if uncorrected as the youth matures physically and matures in his capacity for enforcement of his personality, he may easily pass into a state of permanent arrested development. This is the state described by the negligent parent when he helplessly remarks that his son "has got beyond him."

8. *Acceptance of the value of co-operation.*—In following out a series of histories, we encounter the note, "Will not take part in the group activities of the school; keeps by himself; will not co-operate." The wise observer looks behind the charge, for when one grown person thus accuses another the accusation is not infrequently an inversion of the facts. Nevertheless, the defect is not uncommon, and of course it is a critical fault in conduct. Now, early in the kindergarten, in the period of infantile egoism, the normal child as a matter of fact does not play the game. Literally so, for it is hard to get him into the circle. But in due season he joins up and normally grows into the natural inclination to work with others. A pronounced non-co-operative attitude in later life therefore implies an arrest in development at the childish level, or else that something has caused a perversion. The normal teaching procedure is to check up on the development of the attitude in young children and see that all are put in the way of experiences which will lead to natural growth. Corrective work at this early stage is discovery and elimination of causes which are hindering development. If left to himself with no effort to check up and correct, the retarded pupil becomes a remedial case and one of the most pitiable of all such cases.

Co-operation in full implies a sense of corporate responsibility, that is to say the feeling that the individual is under obligation to see that the group goes right, and in general co-operation is only another name for "team work."

In our consideration of this attitude, as well as of those previously discussed, we are not concerned primarily with an objective which is merely a social virtue. Right attitude here is an element in normal personality not merely because society requires it, but because in the evolution of the individual in society it has of necessity become a trait of the normal individual.

9. *Fidelity to promises*.—A very common obstacle to the development of right conduct is failure to sense the sanctity of a promise. In character analyses of conduct problems, as well as learning problems, in the senior high school or junior college, we frequently meet the verdict, "Promises readily but never carries out a promise." So does the young child in preschool years. In the latter, the trait is normal; the child has not yet come to sense that a promise is anything more than a verbal reaction calculated to satisfy present insistence. The vigilant parent sees to it that his infant not only promises but carries out his promise. The child soon comes to sense a connection between the promise and its fulfilment. More than that, he senses the imperative involved as a matter of self-respect; in other words, a promise comes to have sanctity.

The youth or adult whose promise is a broken reed is usually another case of childishness. He exhibits this fatal trait in character simply because he has never had to learn any better. He is the victim of neglect at home or at school or both. His case is in reality rather simple, providing he has not matured to the point at which he cannot be compelled to realize his promises. Treatment consists: first, in seeing that he does in fact carry out his promises; and, second, in convincing him of the essential inferiority of the person whose promises are not entitled to respect.

10. *Obedience to constituted authority*.—Lawlessness is so obvious and so fatal an ingredient of defective conduct that it

would be trite to include it in our enumeration, were it not for the importance of noting the significance of obedience as an element in the civilized personality.

Like most of the traits which constitute the latter, obedience has an evolutionary significance. In other words, it is a form of racial adjustment. Even in the prehuman series, obedience to the training of the mature generation has a survival value. The cub fox who heeds the vixen's constraint is likely to survive and contribute to the generation of other foxes like himself. His brother whose curiosity or greed leads him into devious pathways unsanctioned by parental approval experiences a short life and perhaps not altogether a merry one. The child of the present day who obeys is likely to survive; the child who does not obey is likely to perish early, under the wheels of a rushing automobile, for instance. Obedience is then a trait in the normal personality, that is, the type of personality which is, other things being equal, adjusted to environment. Of course, obedience to constituted authority is the primary element in the ordered social group.

Nevertheless, we are far more interested in obedience as an element in maturity and sanity than as a matter of social conformity. Because the individual is *socius* as well as *self*, personal normality necessarily implies ordered social adjustment.² It has been suggested that learning capacity and even mental capacity itself are often matters of conduct development. Nowhere is the

² Infantilism in this conduct attitude probably lies at the back of many if not most of editorial and popular-writer deviations referred to by Williams in the passage quoted on p. 363. Unable to adjust themselves in comfort to the ways of civilized existence, they compensate by "making faces" just as does an unruly urchin in the fourth grade. Publishers announce a new book, bearing a title which would have charmed the denizens of the old Congo if they had been able to read, with the statement that it is "daringly frank." It is daring in the same sense that young yokels in old-time district schools were daring when they threw spitballs behind the teacher's back in order to make capital with the females of their species. And so the "young iconoclast" in art is apt to be merely a personality who is so wayward that he cannot sense that there was valid artistry before he was born, that he is merely a fragment in the stream of culture.

principle more pointed in its application than here. Most experienced teachers in commenting on pupil failures have occasion to remark, "This pupil could learn but he won't." In other words, the pupil is lacking in *docility*, teachableness, rather than in mentality; and docility is in the main an implication of the attitude which we commonly call obedience as contrasted with waywardness. More than that, as we have seen,⁸ capacity for learning from the older generation is largely a matter of the native tendency to pattern after the respected adult. Neither the home nor the school succeeds in getting the young child, or the older child for that matter, into the attitude in which he will tend to follow adult lead unless he has been constrained into the attitude of obedience upon which respect is founded.

Unquestioning obedience in the infant and young child is perhaps our best starting-point in breaking down the native egoism of childhood and the beginning of the process of building up the normal altruistic personality. As the years go on, however, if obedience remains merely passive, the result is a simple performance ideal, no better and no worse than the learning in other types which achieves the passing grade in the daily lesson and contributes nothing to the pupil's intelligence or to acquired ability. Passive obedience should normally evolve into willing and intelligent obedience, in which the individual obeys his superior officer or the law of the land because it is right to obey, and because he prefers to obey, whether he approves his orders or believes in the law or not. Perhaps the supreme adjustment is found in the youth who says to himself, "I shall respectfully protest this order or this law, and then I shall yield to none in the fidelity with which I carry it out."

The attitude of adolescent or adult passive obedience and that of lawlessness and insubordination seem to be equally disorders of personality.

Passive obedience is the attitude of the child, and, if found in maturity, it is the attitude of the slave. We can feel nothing but

⁸ See p. 352.

contempt for the man who obeys the law because there is a policeman close behind. He is not a free man. We may be very sure, if we analyze his character, that we shall find a person who is lacking in self-respect and personal dignity.

In contrast with the servile type is the lawless individual arrested at the infantile stage. He refuses to conform to the requirements of social existence not merely because he is unwilling but because his defective personality makes it impossible. He senses his essential lack of self-respect and endeavors to compensate by loud proclamation of what he calls his rights and by demagogic apostrophies of individual liberty. It is interesting to note that perhaps the most lawless period in the last hundred years has been precisely the one which has been most distinguished by the degradation of democracy to the level of fetish worship. The hollowness of this individual's "liberty" compensations can be seen in the fact that with rare exceptions the victim becomes the most hateful of tyrants when he finds himself in a position of authority.

In recent years there has appeared in the schools an utterly absurd interpretation of the ethics and educational bearing of obedience. The exaction of obedience is felt to be ethically wrong and fatal to "character building." How much of this view is to be interpreted as a defense reaction for pedagogical self-indulgence or inability to manage lusty youngsters I know not; I suspect a great deal. Much of it is certainly an instance of pedagogical demagogery—popularity hunting. Some of it is traceable to the writings of educators who were never successful schoolmasters themselves.

One aspect of this general view is entitled to some respect although it seems to be an instance of muddled thinking. It is noted that instances of suppression which leave the pupil in a rebellious attitude are hardly likely to promote growth in conduct. Quite true. It does not follow that the pupil need be left in a rebellious attitude; on the contrary, most strong teachers can recall many instances in which former pupils have felt impelled to

testify "What you did to me then was the making of me"—and of course for every one who does there are many who do not take the trouble to express themselves. The inference is drawn that obedience ought never to be exacted which is not willing obedience, and that commands ought always to be accompanied by explanations which appeal to the child as reasonable. The inference is of course an example of logical inversion in educational thinking, for it assumes an educated personality in the child who is still in process of education. Conformity to a requirement which the child senses to be desirable and reasonable is clearly not obedience at all, not even willing obedience. Willing obedience, which is of course the desirable end, is conformity to the requirements of just authority whether the action itself from the child's point of view is desirable and right or not. Sublimation has been established when the individual has come to prefer obedience as being in itself desirable. Nevertheless, on the way to this desirable end there must be innumerable instances of distinctly unwilling obedience in which, however, the child senses the "mustness" of the situation. The crux of the matter rests upon the child's respect for and trust in the elder, and not upon the former's rational conviction of the desirableness of the specific act required.

11. *Sustained application—capacity for hard work—effort.*—We have met this unit in conduct in Part II, where it is treated as an element in study capacity, and we have discussed there its relation to the problems of interest and of self-direction. We need do scarcely more here than call attention to its obvious conduct significance. We are not born with a disposition to work hard and stick to the task until it is finished; we have to acquire the attitude. In the end, the individual who has acquired the capacity has added an element to his own self-respect and in it he finds one of the highways to security and peace. Here again conduct is a feature of learning capacity.

12. *Sense of duty.*—Practically all the mechanisms of civilized existence—the administration of the police power, integrity

in business relations, the maintenance of family obligations which lie behind individual rights, and many others—rest in the last analysis on a sense of personal obligation which we commonly call *duty*. There is no question of reasoned conviction or sense of individual advantage about it. No democratic state acting as organized society has ever been able to secure the fundamental conditions of social well-being, either in citizens or in public officers, through the deterrent effect of fear of punishment. That is the reason for the requirement of oath or affirmation in our fundamental laws. But the requirement is there only because it was felt that an act surrounded with the solemnity of religious sanction would call compelling attention to sense of personal obligation. In an age in which this type of religious sanction has lost much of its ancient effect, we have no recourse but the inculcation of the fundamental conduct attitude itself. Explaining to a pupil why he should undertake certain acts out of which he can expect no profit and no satisfaction, unless it be the satisfaction of duty done, is unconvincing because duty cannot be explained; it must be felt. The problem is essentially one of appreciation teaching and the technique is the awakening of the sense of duty much as the sense of value is awakened in a literature course. Very probably the center of the teaching will be the holding up of a mirror in which the pupil can see himself as other and valued associates see him and persistence in seeing that he performs at least one act which is motivated by some sense of duty, however feeble the latter may be.

13. *Leadership*.—If we mean by leadership what is essentially a phase of creative genius, then no educational problem is implied and certainly no conduct attitude. So far as such leaders are concerned, the secondary school is far more concerned with developing people who possess the intelligence, taste and conduct which make them capable of selecting by ballot good leaders and following them than in the production of leaders themselves.

On the other hand, willingness and ability to lead the minor

group on occasion is assuredly a conduct attitude in civilized society. Born leaders of the executive type are few and far between; very few of our Presidents have been such. Nevertheless, very few people indeed are incapable of "leading out" if they only will. It is far more a matter of volition than of inherent capacity. Those who have had extended experience in the missionary endeavor to get something done through group action must have been impressed by the indolence and protean excuses of those who realize keenly the necessity but will not themselves take the initiative. They rest in the lazy and selfish expectation that "somebody will do it."

Here, as always, learning arises out of experience. Experimenting with the problem in the Laboratory Schools seems to leave little room for doubt that if from the earliest days of school life children are expected to lead the group on occasion they come to sense the experience as part of the day's work, not very different from any other kind of learning experience.

14. *Fortitude*.—The endurance of physical pain and the slings and arrows of outrageous fortune is so valuable to society as a characteristic of the individual that early on his way to civilization man esteemed it as perhaps the first of the conduct attitudes which enter into the structure of the effective social group. Very often he attached a supernatural sanction to the quality and surrounded it with religious rites. Witness the various torture dances of the North American Indians. The ancients, and especially the Romans, refined the value and attached supreme importance to it. In the long run those societies survived which prized it, and, other things being equal, they made progress along the pathway of civilization.

With us it has ceased to have the critical military importance formerly attached to it, for after all we are not entirely pre-occupied with warfare, but it has not for that reason become less important as a characteristic of complete emergence from infantilism. In the picturesque language of the street, it appears as "ability to stand the gaff." Its value in the developing person-

ality appears as ability to face the inevitable and to "accept the universe." It thus becomes an essential element in learning capacity or adaptability. The retarded adolescent or adult is continually handicapped by his refusal to accept reality and easily becomes entangled in a maze of attempted escapes.

15. *Punctuality*.—Civilized existence is full of synchronizations. Ordered society, in all its maze of personal relationships, has become possible very much in proportion to progress in the invention of instruments for keeping time and the distribution of time-keepers among the population. But no watch will compel an individual to keep an appointment or to connect with a train. The conduct attitude is more important than the mechanical appliance. It is interesting to note, in the comedy of human affairs, how people who otherwise merit our admiration for the nobility of their conduct, often fail essentially as good citizens because they fail at a critical point. Not all but most of the major attitudes which make the essential conduct structure rest on this critical social value of punctuality. It has been, from time immemorial, one of the cherished school virtues and perhaps it would be superfluous to mention it here, were it not for calling attention to its significance in the mature personality.

IV

Other conduct activities which constitute major elements in the integrated and self-respecting personality might be added. We find the items of the list conspicuously in our cases and in the anthropological and ethnological literature. We can be confident that they furnish a useful working analysis and list of objectives. In searching for others, we shall need to bear in mind two cautions.

SYMPTOMS MISTAKEN FOR ATTITUDES.—In the first place, it is very easy to mistake symptoms for attitudes. Each of the fifteen has of course numberless manifestations by which we know it, and other numberless pupil experiences may be used in devel-

oping the attitude, but such manifestations are symptoms and not the attitude itself.

Again, various traits are symptoms of maturity and personal sanity in general.

This is apparently true of truth-telling, as distinguished from scientific love of truth, whereas lying is either the symptom of an infantile personality or else of a morbid condition.

It may have seemed strange to the reader that honesty is not included as a conduct attitude. Apparently it should have been among the first. Nevertheless, honesty is only the negative of dishonesty and the mark of a matured and well-balanced personality, matured not only in conduct but in intelligence and taste as well. Over a somewhat extended period in the laboratory in which children were checked for evidences of honesty, such were seldom found nor yet was dishonesty found. And so it is. We do not find honesty in life because honesty is normal; we find dishonesty, or else honesty because we expected to find the opposite. These Laboratory-School children were simply developing normally. Later on, we should find instances of retardation in conduct and we should very likely call the outward behavior dishonest. Closer analysis would disclose that the real situation was failure of various positive attitudes to develop, notably of course sense of property rights.

On the other hand, unlike the conduct attitudes proper, honesty is a matter of ethics, that is to say discrimination between right and wrong. For example, the author has studied the behavior of men who were notoriously guilty of selling their votes and thus betraying their trust. Very often such men were faithful in other concerns of life. They were loyal and what is called good family men. If college graduates, they were intensely loyal to alma mater. In case of military need their attitude was seldom to be questioned. In general, the conduct attitude of cooperation, team work, sense of corporate responsibility, was apparently well developed, but on the issue in question personal development had not advanced to that point at which the mature

conduct attitude would carry behavior in a case of purely civic trust. I suppose that most of them could not assimilate dishonesty here to dishonesty in more accustomed situations in which it would be scorned.

Again, what teacher or administrative officer has not been perplexed and discouraged at "cheating in examinations?" In many, and perhaps most such instances the student is a person of honor in his general conduct structure, that is, he is mature; but the purely ethical discrimination is not in his makeup. Indeed, the high school and college in their tests and examinations frequently set up an ethical situation the meeting of which would require a saint and philosopher combined. Further, the examination experience is prone to be so false to educational reality that it may be doubted that there is any ethics in it. See chapter v, page 67. The teacher who knows how to set a valid test has little trouble with cheating for cheating in such instances is meaningless to the pupil himself.

V

TEACHING.—Here, as always in teaching, organization is the major part of method. Organization has been suggested in our discovery of the conduct units. A large part of the remainder of method is systematic procedure. The mastery formula applies here as elsewhere, only the formal procedure of testing and re-teaching which is applicable in regular courses must be understood as meaning pupil observation and study and patience. One may expect to establish a given learning product in algebra in an assignable time, to be measured in days if not in hours. Not so in the conduct attitudes. Years are likely to be required before we can feel confident that an abiding sense of duty, for instance, has been established. But holding a series of definite objectives in mind makes all the difference between chance learning and systematic achievement.

MATERIAL.—In attacking the teaching problem, we need at the outset to look for our sources of the material which is capable of exerting an educative influence.

First of all, we have the abiding literature of the race. Most literature which has survived the best seller stage is the treasure-house of the aspirations of humanity. Therein is recorded in one form or another the idealization of great conduct and scorn of baseness. Through right and effective contact with the literature of his race, the youth comes into his inheritance of the moral achievements of that vast multitude of witnesses who stand behind the passing and often trivial influence of his family and contemporaries. The well-ordered school contributes that influence in its carefully selected and abundant free-reading opportunities and in its skilfully conducted classes in literature and history. If the youth fails to enter upon his inheritance in the secondary period of his schooling, he embarks upon life equipped with only the ideals which his own age can furnish, and that is in any age a meager stock indeed. A nation recruited from such young people must forever be entering anew upon the long process of racial evolution.

In the second place, we have the life-histories of men and women who have moved the race forward and who have furnished our best examples of noble conduct. The influence of the character of Lincoln in molding the conduct in public affairs of men who came after him and who really established an interest in his life has been incalculable. The influence of the characters of Newton, Darwin, and Pasteur in molding the attitudes of scientific men toward their professional conduct has been perhaps not less important than the intellectual contributions of these great men to science itself. Unhappily, our stock of biographical material suited to the reading of children and young people is not as extensive as we could wish, and it is heavily unbalanced in the direction of exhibiting the characters of military and political heroes. Even in that field, the tendency has seemed to be to exalt the successful commonplace rather than genuine nobility and genius. Nevertheless, there is still a great wealth of material to draw upon, and it should appear in abundance upon the shelves of the reading-room; it should form a unit in literature,

not only for its present contribution but for the sake of cultivating an abiding taste and discrimination in the field of biography.

The third great source of examples of right attitude toward conduct is the teaching force itself. The influence of teachers, possessed themselves of simple nobility and strength of character, is of course critical. It is an unhappy individual, indeed, who cannot look back to the lasting influence of at least one such. Right attitude is at bottom a sense of value. If there is no value in the child's environment to sense, it is futile to expect adjustment. Outside of the family circle, the teaching force of necessity stands as the model which the older generation offers to the younger. The requirement is at the least strength of character and maturity of personality. If the youth seldom comes in contact with these qualities in his teachers, society need expect no positive right attitudes in the rising generation. If the youth seldom encounters a teacher who is devoted to the teacher's calling as a career and who has matured to a stage essentially beyond that of himself, it is futile to expect that the youth will take on the conduct attributes of personal maturity. If the child is accustomed to meet in the classroom the pedagogical demagogue who maintains his position only by making himself popular with immature pupils, we need not be surprised if the result is a citizenry which is incapable of being led except by the political demagogue. In the long run, by far the most influential factor in the molding of the school child is the tone of the school, and positive tone is imparted chiefly by the faculty if at all. Unhappy the student who finds himself in a school in which the tone of the institution is established by strong students rather than by a strong faculty.

Closely related to the influence of the teaching force itself is the theory upon which the whole administrative technique of the school is carried out. We have already discussed fundamentals here. If we set up a passing grade based on relative performance instead of focusing our test upon the mastery of correctly identified learning products, we need not be surprised if we generate

an attitude toward life in which "getting by" and humbuggery are conspicuous elements, and such we find in fact to be the revelation in a multitude of cases. If the child is accustomed from his earliest school days to judge himself by comparison with his neighbors rather than by comparison of his present attainment with past attainment, it is likely that envy and malice, arrogance and servility, will come to be powerful contributions toward his conduct. The end result tends to be arrested development in altruistic attitude, in right acceptance of criticism, in devotion to a social group, in fidelity to promises, in sense of duty.

MORAL SANITATION.—In contrast with the positive influences which can thus be organized and focused upon the development of right attitude in the school as a whole, there is what may be called moral sanitation, the elimination or correction of harmful influence.

We first think of the harmful influences of vicious pupils, especially in the high-school and junior-college periods. We have to distinguish critically between the undeveloped pupil who is not yet positively vicious and who is still an appropriate object of general education and the pupil who has passed into the field of legal delinquency—the thief, the inebriate, the youthful rake. Such individuals are likely to be instances of outright social pathology requiring separation from the school and treatment outside the school. We have no more right, nay less right, to expose the whole school to the infection of their presence than to expose the pupil body to the menace of a case of scarlet fever or measles or diphtheria. They should be excluded and provided for, either in corrective institutions or through some other form of corrective treatment.

We next note the baneful influence of perverse literature, with which we have already dealt at length more than once and which we need only to note here in passing.

Finally, there is the ever present need of corrective influence directed to the school as a whole. We cannot censor the sensational and often salacious newspaper and dramatic production,

nor can we prevent the publication of shallow books calculated to destroy the student's faith in God, his country, and his fellow-man. We have already shown how to some extent such influence can be counteracted in the free reading made available and in the classroom in literature. It becomes further pre-eminently the task of the executive, if he is worthy of the name teacher, to set the student body right. My mind goes back to my own college days for an illustration. Thirty-five years ago, the press was less shameless than it is today and dramatists had not yet conceived it to be art to wallow in filth for filth's sake, but nevertheless then as now occurrences found their way into publicity which were well calculated to pervert the inquiring mind of youth. "They are all doing it" exerted its debasing suggestion as it always does. But a great college president thought it to be his duty once a week to comment upon the news of the day and to set the student body right in its thinking.

VI

ORGANIZATION OF THE STAFF.—Systematic administration of the foregoing influences under a strong executive and at the hands of a competent faculty hardly ever fails, even under rather adverse conditions, to develop a wholesome tone in the school. The great majority of the pupils acquire, or are on the way to acquire, right conduct. Furthermore, among the older and stronger and more influential pupils will arise a potential praetorian cohort capable of becoming an incalculably valuable factor in controlling and developing the school. There remains the need of intimate contact with the public opinion of the student body and of intensive work with individual pupils. The organization of the older and stronger members of the faculty into an advisory group is perhaps the first step. But such a group must be intelligent about its problem, diligent, devoted, and it must work systematically. Otherwise it becomes simply a perfunctory paper organization.

The reading-conference groups perhaps constitute a good be-

ginning, and will continue to operate as a correlated enterprise. Beside this system should, however, operate another in which perhaps not exceeding fifty pupils are assigned to each of several members of the faculty chosen for the purpose. These teachers have an hour set aside daily for meeting the individuals of their groups. Meeting not more than an average of five pupils daily, each member will get around his group about once in two weeks. Now two purposes are served.

First, much of the time taken with individual pupils will be utilized for guidance in their school work, planning courses and the like, and for gathering information which finds its way into the pupil's case folder (see chap. xxxi).

We are concerned here, however, particularly with the process of building up and generalizing conduct in the individual and in the school. The process involves: (1) setting the individual right on sundry issues, and (2) collecting data touching the actual condition of school morale and identifying the corrective points. But the individual adviser working with his group has covered less than half the task. In modern personnel work, the staff conference under the guidance of the executive, or the chief personnel officer in a large school, is on the whole the crux of the enterprise. Here is the clearing-house of problems, both of the individual and of the school, here is the point at which intelligent forward policies emerge, and, perhaps most important of all, it is in the staff conference that evidential material touching the development of right conduct is gathered and evaluated.

THE PROBLEM CASE.—Out of the reports of the student advisers and those of the classroom teachers emerge the conduct problem cases.

The whole theory of teaching which is founded on the passing grade and the philosophy of organic determinism tends to induce the school and the teacher to note these cases, identify them as bad boys or bad girls, and pass on with a sense of duty done. The obvious effect is a stream of maladjusted individuals who pass into society and contribute to the recruitment of our delinquent

classes or, what is perhaps worse, to the immensely larger class of semi-delinquents who pass their lives skating on the thin ice which separates the sound footing of wholesome and right living from the black water of legal notice and punishment. These folks are perhaps, on the whole, a more pernicious influence in society than the out-and-out criminal, just as the typhoid or diphtheria "carrier" contributes more to the ill health of the community than the identified and quarantined victim of disease.

The appropriate procedure conceived in a scientific spirit and from a valid educational point of view is to set up a regular organization equipped to deal with conduct cases by the case method of study and treatment. An adequate discussion of the theory and practice of case work requires a volume. We find space for a chapter (see chap. xxx).

VII

TESTING.—The principle that unsupervised and unconstrained behavior is the only final test of a true learning product is of course singularly applicable to conduct. We may indeed set up extended tests in the form, "What would you do in such and such a situation?" Incorrect responses may reveal failure to sense the meaning of the questions and they may reveal that the pupil is ignorant of what right attitude should be. Right responses, on the other hand, give us evidence that the pupil knows what right attitude should be, but they give us no evidence of attitude itself. Young people, like the rest of us, are prone to see the better course and approve, but follow the worse. Nevertheless, pupils are under observation in the school for five or six hours daily and their out-of-school lives are more or less within the observation of teachers and the personnel staff. In other words, a fair sampling of their conduct is under observation, and that conduct is full of evidences of the nature of their attitudes.

It is futile to think that a routine of scoring can be adopted through which there will pass periodically to the principal's desk a mathematical representation of each pupil's attitude. Attitude is not susceptible to that kind of description. Nevertheless,

through the teacher's personnel cards, and through the advisory-staff conferences, there does grow up a very satisfactory picture of each pupil. Periodically, perhaps twice a year, the entire school can be canvassed in terms of the practical question, Can this pupil and this be trusted with respect to this or that particular attitude? Such a canvass will normally yield something like the following distribution:

- I. For *a* pupils, the answer is positively "Yes."
- II. For *b* pupils, the answer is positively "Not yet."
- III. For *c* pupils, the answer is "No evidence, either one way or the other."
- IV. For *d* pupils, the answer is "Clear problem case."

Now the tendency at first will be to include under I both those who properly belong under I and the negative but well-behaved individuals who properly belong under III. Not so; the decision should be on the evidence. If there is no evidence justifying the I classification, then the pupil should be classed III, unless indeed there is evidence which places him in II or IV. In the elementary school, the early part of the secondary period, there will normally be few who really classify under I, but there may be a few. There will be a great many who classify under II and III and perhaps a very considerable number who classify under IV. While we are happy to get the I pupils, the presence of large numbers of III at this level probably means that the majority are simply developing in a normal fashion and at the senior high school or junior college level they will appear in Class I.

As we go on into the junior and senior high school and junior college levels, while there will be some fluctuations, as individuals previously in III class transfer for a time to II or even IV, on the whole Class I will steadily expand. In the end, let us say toward high-school graduation day, or the completion of the junior college course, the distribution should show something like the following:

We know that the great majority can be trusted, that is, that they have attained right attitude toward conduct. We know that

a certain few cannot be trusted. As to some others, we do not know whether they can be trusted or not, but this group should be held to be evidence of culpable failure on the part of the school. A school which has ministered to the needs of a pupil for four years or longer and still does not know him well enough to pass judgment on his character is colorless indeed.

VIII

MASTERY.—Does the notion of mastery apply to conduct? Is it not equivalent to asserting that a pupil is perfect to hold that he has reached a mastery level in conduct? If one persists in the hundred-per-cent-performance conception of mastery, it is absurd to cherish the idea at all, here or anywhere else. But such is not the case. Throughout this volume mastery is contrasted with the partial-performance theory of appraisal. Nevertheless a somewhat peculiar situation exists in the present instance.

In conduct behavior we are to a singular degree under the control of organic and instinctive urges. Even a bad digestion throws us temporarily out of adjustment. An individual may be fully matured with respect to his several conduct attitudes and ordinarily act like a gentleman, but on occasion he may lapse woefully, entirely apart from pure ethical ignorance. His act itself is evidence against the establishment, or mastery, of the attitude in question; but the remorse or shame which he afterwards exhibits is equally good positive evidence of the presence of the attitude in his personality structure. As time goes on, and the whole organic structure becomes better integrated, lapses become less and less frequent, especially if the individual is in good bodily health. Ill health, as we all know, sadly interferes with our whole appreciative and even intellectual life; but this is a problem in health and not in conduct.

CHAPTER XXI

THE PRACTICAL ARTS IN GENERAL EDUCATION

WE have to do in the present chapter with a body of material which has found its way into the school curriculum, largely in the last half-century and largely in response to pressure exerted on the school compelling the latter to become an instrumentality for social adjustment. We are concerned with such material because it calls for a specific type of teaching, and we shall find it hard to understand teaching unless we can frame a reasonable theory of the nature of the objectives sought and of their place in the process of general education.

As a type of teaching procedure, we are concerned with processes which involve the manipulation of physical material or the intelligent operation of appliances. Pedagogically, the type stands between the science type, in which the learning process is essentially a matter of reflection, and the language-arts and pure-practice types, in which adaptation is entirely a matter of learning by doing. In the practical-arts type, learning is both a process of reflection and of learning by doing. Among the subjects commonly found in the school which belong to the type are shop work of various kinds; domestic-arts courses in cooking, sewing, dressmaking; accounting and office practice; drawing, both mechanical and free-hand; modeling, designing, etc.

I

IN GENERAL EDUCATION.—This volume is confined to the teaching processes which belong to the field of general education. The practical arts as they are found in American schools are pre-vaillingly in the various special vocational fields. The legitimate objectives in general education are materially different from those which are essential in the vocational field. In the former,

intelligent attitude bulks large but respectable skill in manipulation is not ignored; in the latter, special craftsmanship and skill of manipulation are of the essence of the learning but intelligence as opposed to rule-of-thumb is an element in genuine craftsmanship. Any educational policy, however, which meets the test of contribution to environmental adjustment, must provide a region of contacts which can be achieved only through the utilization of the practical arts.

Life in the modern world is placed in an industrial and mechanical setting. It is life none the less, and as such is subject to the same fundamental controls as life in any age. When society as a whole lives in a state of passive acceptance of the world as it finds it, we note that condition of prevalent ignorance which is perhaps the greatest enemy of the human race. We can imagine the Lords of Life looking down on humanity and declaring, "You asked for freedom from the blind instinct of the lower animals and we gave it to you; if you would now survive, you must learn." Adjustment to environment means not only understanding and acceptance of natural law, but control of environmental forces, not only individual control but social control.

Granted all this, the reader may say, Does not man through his specialists understand the world as never before? Doubtless that is true, but it does not suffice for the specialist to understand. The specialist discovers and invents but he does not control in the social sense. The group mind does that or fails to do it. The group mind controls wisely or ill or not at all in proportion as the mass of individuals in society are possessed of intelligent attitude. We might illustrate far beyond what the space available will permit. A single instance will perhaps suffice.

One of the outstanding problems created by the Machine is that of the great industrial city. The inhabitants of such live in an atmosphere impregnated with all the essences of the Pit. They find it difficult to dispose of their waste products. Their drinking water is apt to suggest the chemical laboratory rather than the mountain spring. Their food, like most of their living, is con-

ceived in the factory and born in artificiality. Their dwelling places are a reversion to the pueblo stage. Few people would choose that kind of existence, certainly not if they had been familiar with better things, but they are caught in the toils of the Machine. All but a few are possessed of normal mentality but only a very few are possessed of the specific intelligence required by the situation. The specialist works out a remedial step and refers it to a popular referendum. The proposal meets with an overwhelming "No," for the group mind is possessed of the terror of primitive man. It does not understand and, not understanding, declines to move from present discomfort into a promised land it knows not of. The situation changes slowly if at all, simply because there is not enough specific intelligence in the community to create the demand which would sweep away all obstacles to sane and well-ordered life.

Now there are many factors in the problem of the industrial city but the outstanding problem of all is the city itself, and there the factors reduce in the main to two, transportation and the generation and transmission of energy in the form of electric current. There will never be "alabaster cities" on the continent so long as the local consumption of soft coal is the principal source of energy. "These things are well known to engineers," responds the specialist, "but the solution is not commercially possible on a large scale." Ah yes, and "commercially possible" is only another expression for intelligent demand. Suppose every graduate of the high schools of the United States for the next ten years were to be made thoroughly intelligent in the layman's sense concerning the practical-arts problems involved, can we doubt that the public attitude of passive acceptance would be severely shaken? We should, in the first place, create an attitude which would greatly stimulate invention and in the second place probably uncover a great deal of latent inventive genius which now goes to waste. We have a basis for more than conjecture in this assertion.

The evidence is found, for instance, in comparative public

health conditions in different parts of the world. The improvement in our public health is one of the outstanding achievements of recent times. We have medical and sanitary specialists to thank? Yes, but to an even greater extent, we have to thank the specific popular intelligence which has been schooled into the public through more than half a century of the teaching of health and human physiology, under our system of popular education. The newspapers have done more than the schools? Not so, the press depends for its reading public on the effectiveness of the schools in the preceding generation. Contrast the public health of America with that of a large part of the Asiatic continent. The etiology, diagnosis, and treatment of disease is the same there as here. Medicine is cosmopolitan and sanitarians are as able to achieve their results in one region as in another. The critical variable is in the ability of the people to read and in the specific intelligence which determines what they will read and understand.

Intelligent attitude widely diffused among the masses of society, acquired only through the laborious and rather slow education of the individual, is assuredly the only pathway into a world in which man rules the Machine which he has created. One essential element in comprehension of the Machine is the understanding of machines.

THE LEARNING OBJECTIVE.—The objective in the practical-arts type of teaching is then much the same as in the science type. The learning process and teaching procedure are necessarily different. The similarities and differences can perhaps be made clear by comparison of a learning product which belongs to the science type with one which belongs to practical arts, for instance, the Industrial Revolution with the gas engine.

In the former, the learner contemplates a set of historical facts which when brought together and understood lead to a new point of view, an intellectual product which becomes thenceforth a means of interpreting the past and correctly understanding the world in which he lives. The pupil can get no concrete experi-

ence with the Industrial Revolution. Indeed, it may be doubted that the learner would profit even if he could do so. It is doubtful that the men who lived in the period in which the transformation was taking place had any such clear comprehension of the process as is possible today. Nevertheless, by reading, study, and reflection the student attains the attitude of intelligence sought. In this particular unit he also makes some progress toward understanding the industrial and mechanical world in which he lives.

Not so with the gas-engine unit. Here physical contact and manipulation are requisite to the adaptation required. True, we may take a book and familiarize ourselves with "the principle" or we may listen more or less understandingly to a verbal exposition, but in the end we have no realization. The learning product is part of the junk of things remembered but not felt. Even if we have a good apperceptive background, as we read descriptions of the mechanism and its working, an emotional stress is generated in which one says to himself, "I must see the machine; take it apart; put it together again; see how it works." Any reader who has been through the experience, first of trying to understand from drawings and description and then of "seeing how it works" from actual contact, can bear witness to the mental experiences involved and to the reality of the assimilation from actual contact.

II

UNITS.—What, then, are the units for general education in the field which thus belongs to the practical arts, or at least what are the principles upon which units can be set up? The principle which we have already established for the identification of the unit in the science type will serve, namely, "A comprehensive and significant aspect of the environment." May we illustrate.

The steam engine with its boiler is a comprehensive and significant aspect of the environment. It covers the locomotive, the marine engine, the stationary engine used for driving machinery, the steam pump. If we were to set up each of these types of steam

engines as units for study, we should gain little in the form of intelligence not obtainable in the study of the more generalized unit, and we should use an amount of time and energy wholly disproportioned to the possible educational results. We should be attempting to give a course in steam engineering instead of developing the practical-arts unit, "The Steam Engine." A sub-unit, providing that the reciprocating engine is used as the type form, is the steam turbine. It is not an element in the unit since an understanding of the turbine does not contribute to an understanding of the reciprocating engine. It is not a fully independent unit since both forms of steam engine utilize a boiler. On these principles both the gas engine and the automobile are evidently units in the practical-arts field. So is the electric generator and the electric motor, the water turbine, the transmission of power, the airship. The heating, lighting, and water supply of residences are units, and so is the disposal of waste, both for the residence and for the community.

Among the processes, as distinguished from appliances, out of which units can be organized are the following: processes involved in the ordinary manipulation of wood, metals, glass, and concrete; processes involved in installing the simpler electrical appliances and the ordinary repairs to house and furniture; processes involved in the selection and preparation of food; processes involved in the construction of wearing apparel.

Of course the field of agriculture has within it numerous processes which belong to the field of practical-arts teaching, and the field itself to a great extent is distinctly one which belongs in this region of general education.

The foregoing paragraphs will serve to exhibit the nature of the practical-arts unit. They do not purport to be a complete program analysis. Whatever the units selected in the organization of the course of study may be, the educational end in view is an individual whose attitude toward the mechanical and industrial world is one of comprehension and understanding and not one of passive acceptance.

III

ELEMENTS.—Recalling the element organization of a unit in the science type, we have perhaps a sufficient guide for organization in the practical arts. The reciprocating engine, for instance, at once reveals the following elements:

1. Pressure in boiler.
2. Expansion in cylinder and movement of piston.
3. The crank and shaft.
4. The slide valve and its function.
5. Link-motion for reversal.

Similarly the automobile as a unit involves:

1. The automobile engine (assuming that the gas-engine unit has preceded).
2. Transmission.
3. Differential.
4. Steering gear.
5. Generator and motor.
6. Lighting system.

In the economical arrangement of units in the course, the gas-engine and electric generators, motors and accumulators will naturally have preceded. Let us then turn to the gas-engine as a further illustration of unit structure. Here the elements will probably be:

1. Explosive mixture in the cylinder and its effect.
2. Ignition.
3. Carburetion.
4. Engines of different cycles.

As in the similar case of the steam turbine, the Diesel engine if desired will be a sub-unit.

The reader will doubtless reflect that some of the types of units suggested in the foregoing enumeration are found to some extent in elementary science courses and others are vaguely familiar as exercises in manual training. Certain principles seem to be involved which are worth considering.

CONTRAST WITH SCIENCE COURSE CONTENT.—It is true that we commonly find in science textbooks paragraphs and several interesting pictures devoted to the steam engine, the gas engine, and their applications, usually in connection with the topic "Heat." The writer has yet to find a text in which the explanations are clear enough to communicate to the pupil any real understanding of these important appliances unless perchance the latter has already become familiar with them under working conditions. The reason why they are introduced is usually the plea that it is essential that the laws of heat should be applied to the everyday life about us, and of course the point in itself is well taken. Note, however, that the learning product in the science course is an understanding of the phenomena of heat and not of the steam engine or the gas engine. These appliances may constitute valuable and even essential assimilative material, but, if they are made objectives in themselves, the whole assimilation period is more or less thrown out of focus. The situation is analogous to that in which clock problems are used for assimilative material in equations in algebra. The pupil has to learn how to manage clock problems before he can use them for assimilative material. It is an instance of the old story of mistaking the assimilative material for the learning product. The effect is unduly to prolong the mastery of the unit and to confuse the pupil. Now the essential value of these engines as assimilative material on heat is found in their utilization of the expansive force of gases when heated, and as a corollary the transformation of energy. For this purpose, a simple diagram which exhibits the principle at work will serve and serve clearly, without going into the study of the working of the appliances as such.

The same principle of the proper use of assimilative material in science courses applies to the various forms of water wheels, to the steam pump, to the electric generator, motor, etc. It also applies to the telephone, telegraph, and radio.

On the other hand, a competent understanding of all these machines themselves is desirable, but it properly belongs to another

course and to another type of teaching, namely, that with which we are now concerned. If, however, no practical-arts course has been arranged and it is still felt to be desirable to deal with the various appliances in general-science courses, lest they be passed over altogether, then separate units should be devoted to them, and these units should receive abundant treatment. The unit "Electrical Communication" found in the elementary-science course and the presentation of this unit exhibited at length in chapter xiv will illustrate.

IV

On the other hand, practical arts may easily be confused with manual training, and it frequently is so confused.

CONTRAST WITH MANUAL TRAINING.—Manual training, as the term clearly implies, has for its objective the development of purposeful sets of neuro-muscular co-ordinations which seem to have played a valuable part in racial evolution and to have an essential place in the evolution of the individual. Handwork leading to the manual-training objective has an important place in the primary school, and it should continue to have an important place until the pupil's co-ordinations have been thoroughly established. Much of the appropriate practical-arts technique may be used, and courses which have primarily a practical-arts purpose in the secondary period may have also a manual-training effect, but for purposes of clear educational thinking the practical-arts and manual-training objectives and purposes should be kept distinct in the student's mind.

The author will perhaps be pardoned if he digresses in this connection into a plea for a renewed interest in manual training proper.

In the urban life of our time, and to an increasing extent in the rural life, there is little room for the neuro-muscular development which used to be taken as a matter of course. The result seems to be a marked increase in the number of children who exhibit poor co-ordination and control. One effect can be seen in the increas-

ing difficulty of getting good permanent results in the handwriting skills. In days when handwork of all sorts was the common lot and when the family chore and odd job was an unnoticed but very important educational instrumentality, manual training took place in the normal experience of most children. It is a far cry from that child life to the child life of today, when mechanical appliances and provision for family tasks outside the home have little by little robbed the child of an important part of his educational foundation. There seems to be no recourse but to bring into the school what was once in the home, not as a perfunctory matter of a period or two a week but as a daily experience covering many school years.

There is, however, in this plea no justification for a school policy which would make all work which involves manipulation of appliances and materials simply a prolonged course in manual training.

V

CONTRAST WITH VOCATIONAL COURSES.—Finally, the practical arts in general education have objectives which, as we have seen, are different from those of the practical arts in vocational training, and to some extent they require a different teaching procedure. In general education we seek only the intelligent attitude which the layman should have; in vocational training we seek craftsmanship and trade intelligence and proficiency. In most if not all vocations, the practical-arts aspect is but one of many, for the intelligent practice of a given trade requires knowledge of trade circumstances as well as operative skill in its manipulations. Proficiency in the latter requires not only intelligent attitude but skill which is the result of special intensive training. In general education we are concerned primarily with the development of an individual pupil and hardly in a secondary sense even with the quality of the material product turned out in the shops. In vocational education, we are still concerned, or should be, with the development of the human individual, but we are also concerned with the quality of the output he becomes capable of pro-

ducing as a proficient personality. Altogether, schools frequently fail to draw the line critically between practical-arts courses which are intended to serve the purposes of general education and those which are presumed to achieve a vocational product. The result is waste of time, energy, and educational efficiency when only a result in general education is sought, and complete failure to achieve a valuable trade proficiency if the end is a vocational one. An illustration may be found in the courses in mechanical drawing which are so commonly found in the high school.

In these courses, a long time, perhaps two or three weeks, is sometimes spent in lettering, and then the pupils devote many weeks to exercises in drafting plans for various forms of construction which mean nothing to them so far as practical experience is concerned. Of course we have here another illustration of the ground-to-be-covered and daily-exercise stereotypes. It is hoped that a year, or two years, of this sort of practice will yield some educational product, we know not what or how. We have what is essentially a vocational course but without regard to any specific vocational product. Training in drawing is given, but not the use of drawing for the pictorial representation of specific aspects of the practical-arts environment or of specific vocational projects. The learning products are not identified and segregated, and actual learning is consequently a matter of chance.

Now, in the field of general education, mechanical and free-hand drawing are valuable tools in interpreting and expressing and consequently assimilating various experiences found in the practical-arts environment. There are few people, indeed, who do not have occasion frequently to seize a pencil and attempt to explain a structure or a mechanism in which they are interested. Their representations are usually crude and in effect their ideas correspondingly nebulous. Drawing stands to the practical arts very much in the same relationship which written expression bears to the content of the science and appreciation types. In

either case, expression is the instrument which we use in the clarification of our ideas. Hence, in general education both forms of drawing are emphatically expressional tools, as necessary to the mastery of many practical-arts units as mathematics is necessary to the assimilation of physics units and as English writing is necessary to the mastery of all units in which the objective is intelligent attitude. Furthermore, the adult individual, in the presence of his mechanical and industrial environment, has occasion frequently to read working drawings. He would have occasion to do so more often if he only had the ability.

We are thus enabled to form a working notion of the appropriate scope of the drawing courses in the field of general education. We need, in the first place, a set of learning products which will enable the individual to express graphically the gross aspects of the practical-arts experience of his daily intercourse. These learning products do not include the specialized operations which the individual can confidently leave to the technician nor do they include the skills which are essential to the professional draftsman. The learning products thus understood, simplified, and segregated are relatively few in number.

In vocational training, on the other hand, we have two classes of objectives which must be borne in mind.

In the first place, workers in many fields require only the general-education learning products while others require these in the form of further special application to their own vocational field—auto mechanics, for instance.

In the second place is training in draftsmanship itself, in its various fields, as a vocation. If we desire to produce a draftsman who is something more than a mere copyist, we must probably begin with a course which develops the general-education learning products in drawing. Beyond that, the learner is given a severe course of training in a series of units which are carefully selected with reference to their general applicability in all the special fields which have need of the draftsman. Severe training implies the development, not only of specialized intelligent atti-

tudes, but likewise of skill in the technique of the vocation. Follows special training in the narrower field chosen by the worker, architectural drawing or drafting in the mechanic arts, or what not.

The differentiation between general-education and vocational objectives thus illustrated from the field of drawing is applicable throughout the field of the practical arts.

Lest the principles suggested in this chapter be misunderstood and misapplied, it is perhaps pertinent to remind the reader that we are dealing with the practice of teaching in the secondary period and not with the organization of schools. It should not be inferred that a high school which is in the main devoted to the purposes of general education is thereby in principle estopped from also offering courses in special training in one or more vocational fields. The essential consideration for the management of the school is the principle that an appropriate differentiation shall be made between practical-arts courses which are designed to be contributions to general-education and practical-arts courses which are designed to impart effective vocational training. The teaching procedure which is effective and sufficient in the first will always prove inadequate in the second; and that which is required in the second leads to an objective which is not at all the objective legitimately implied by the first.

VI

HOME WORK.—The reach and the extent of the adjustments in the individual which are included in the field of the practical arts can by no means all be covered within the walls of the school. In the first place, the field is too broad; and in the second place, the school does not, and probably cannot, provide the necessary assimilative experience in some of the practical-arts units. The instance which will perhaps first occur to the reader is in secondary agriculture. Whether we view a course in horticulture or one in field crops as a vocational course, as it perhaps usually is, or as a practical-arts course in the field of general education, as it often

should be viewed, the field project is the core of the assimilative experience. It is as futile to attempt to teach such a course from a textbook as it would be to attempt to teach elementary algebra without problems. Now in certain types of schools in which the students reside on the grounds, practical field projects can doubtless be provided on the school estate. In most public schools, reliance must be placed upon the home project, and this is to the advantage of both home and school. The experience of the past twenty years in the teaching of agriculture has worked out the technique of the home project and nothing further on that point is required.

It is often noted, however, that many others of the practical-arts units are as truly opportunities for home projects as is a course in agriculture. The heating of homes, for instance, calls for study in the school of the principles upon which heating plants are operated. It none the less calls for the actual operation of the heating plant itself. The thoroughly normal and wholesome American home, where it can do so, still requires its sons of high-school age to perform this residue of the chores which were once so important a part of the boy's education. The home still has numberless small jobs which the young people can do and should do, and the energetic practical-arts teacher will organize a systematic connection between the home and the school in this field. In cooking, meal planning, dressmaking, and other home occupations, the opportunity and the need of the home project are obvious.

The reader will doubtless note in passing the intimate connection between the carrying out of home projects as an integral part of the work of the school in the practical arts and the development of right attitude toward conduct discussed in the preceding chapter, especially in all that pertains to normal volitional growth.

It is quite true that the school is often met in such cases by the protest of the home. "Cheaper to hire it done than to have Mary do it." "More trouble to make John attend to the job than to do

it myself." "That is the janitor's job or the housemaid's." The home must be convinced that in the nature of the case it cannot delegate the entire education of its children to the school, that it is not a question of being able to pay for things the young people might do but of educating the rising generation. Doubtless diplomacy and address in the school are required for the convincing of the home. There is no law to which appeal can be made nor can there be any law. In the education of the children there is frequently imperative need of educating the home, and the school cannot meet its responsibility to education merely by adopting a policy of renunciation.

The foregoing is written with due appreciation of the fact that home life under modern city conditions has sometimes made household duties for the growing boy and girl entirely impossible. The fact does not negative the principle; the choice must sometimes be made between a manner of family life and the normal and right upbringing of the children of the family.

Such assimilative experience as the home project makes possible must be supervised by the teacher just as assimilative experience within the school walls must be supervised. Hence, the definite outlining and mastery of the home project and systematic inspection by the teacher. Just as the teacher of agriculture is allowed time and his motorcycle or automobile for the supervision of the home projects in his courses, so should the practical-arts teacher in the village or the city school be allowed time and transportation to carry out his schedule of inspecting similar undertakings in his field.

CHAPTER XXII

TEACHING IN PRACTICAL ARTS

TEACHING in the practical arts has had one great advantage over teaching in most of the so-called "academic subjects." It has never been susceptible of the lesson-learning type of treatment. No matter how formalized the teaching may have become, in the end learning must always perforce be direct learning and not lesson-learning. Whether the pupil is set to the making of a joint which is never used except in schools, or to the carrying out of a project in auto mechanics, he encounters real experience, and if he learns at all, he learns from experience; he has not occasion to transfer from learning about a thing to learning the thing itself. This is perhaps why it so often happens that a pupil who is an utter failure in textbook courses succeeds fairly well or even brilliantly in practical arts. In such cases, we probably often have instances of direct learners whose first experience with direct learning is in the shop or the sewing-room.

TEACHING OBJECTIVE.—In the present chapter, as in all chapters which deal specifically with teaching procedure, the point of departure is the nature of the teaching objectives. We recall, then, that the practical-arts objectives, in general education, are a series of intelligent attitudes toward particular fields in the environment. Now such attitudes are comprehensible wholes and not syntheses of piecemeal parts. Intelligent attitude toward the automobile, for instance, is directed upon the machine as a whole, not upon the piston rings or the crankshaft or the differential. In wood-working, the objective is an intelligent attitude toward the management of materials in a construction which has a significant purpose and is felt as such by the pupil; not craftsmanship in the making of a joint. The course is useful as a medium in the

education of a youth, and not as a means of training a skilled carpenter and joiner. Hence the teaching technique in practical arts in the field of general education centers around the project and not the exercises. The project is the type of organization of assimilative experience which is suitable to practical-arts teaching and learning.

I

PROJECT AND EXERCISES.—The project may be defined as a comprehensive and significant piece of construction or of manipulation which contributes to generation of the attitude in the pupil which is the objective of the educative process set up. An exercise, on the other hand, is practice on an isolated piece of manipulation. Thus, the overhauling and reassembling of a gas engine and putting it in operation under its own power is a project. Learning how to grind valves is an exercise. An understanding of the gas engine itself is the unit. The construction of a colony poultry-house is a project in the unit House Construction. Learning how to handle a hand-saw properly is an exercise. The preparation of a suitable breakfast is a project in the unit Meal Planning and Cooking.¹ Learning how to cook cereals is an exercise. It may be that more than one project in a unit will sometimes be found to be desirable.

A certain amount of exercise practice in working out a project is obviously necessary. On the gas-engine project, for instance, the boy will be unable to grind valves properly until he is shown how and has had some practice under supervision in grinding valves. If this element is passed over without mastery, his assembled engine is likely to show poor compression when put in operation. His comrade who is working on the poultry-house will make a poor job indeed if he does not practice until he can saw to

¹ A good illustration, by the way, of the principle that a practical-arts unit may be found in a course which belongs predominantly to another type, in this case the science type. Cooking as cooking has little content short of the trade level. The chemistry of cooking and food values both from the nutritive and from the economic point of view have much content.

a line. It is worse than useless for a girl to prepare a meal the constituents of which are inedible for lack of proper exercise work, or for the boy to set up a gas engine which will not run. The crux of the matter consists in sensing the right proportion of exercise work and its right relation to the project.

In earlier schools, now happily obsolescent, the exercise was the beginning and the end of the course and the project had no place at all. The shop had its proud exhibit of carefully-made joints, beautifully-turned card receivers, series of links in a meaningless iron chain, handsomely-wrought handwheel bereft of any comradeship with other parts of a useful machine. As pure manual training, such exercise work doubtless rendered some service, although service in that direction would have been more valuable if it had been rendered in connection with genuine and useful project work. That stage in practical-arts teaching corresponded to the stage at which a prolonged course in Latin consisted in learning principles and practice in applying them to the transverbalization of the classics. In neither case did any actual education take place except by chance.

THE PROJECT.—The project is a comprehensive and significant piece of construction or manipulation. Explanation of what is meant takes us into the unit organization of the course and perhaps into one corner of the field of the curriculum itself, although the latter is a story by itself. Shop courses will perhaps serve as illustration.

Keeping in mind, then, the principles outlined in the preceding chapter, let us first raise the question, What units will serve to interpret that aspect of the practical-arts environment which we wish to make intelligible to the pupil who is not, and does not intend to become, a specialist in any practical-arts field?

The most obvious aspect of the environment is perhaps house construction. This is then the unit, and the adaptation sought in the pupil is an intelligent attitude toward such construction. Now, if we have in mind simply the house itself apart from its furniture and equipment, house construction involves chiefly

woodworking, glass, concrete, and brick. We shall need, then, to seek the project which will best serve as assimilative experience in learning the unit. A project which appears as the construction of a small house will be significant because it indubitably expresses and interprets the environment; and it will be comprehensive because it includes all the essential processes which go into that type of construction. As a practical proposition, it will perhaps tax the ingenuity of the teacher to provide such a project, but it has nevertheless been done more than once. There are few schools indeed, and those chiefly in the great cities, in which the need of small buildings of one sort or another does not furnish the opportunity. Per contra, a project which would be neither significant nor comprehensive would be a section of concrete or brick wall laid up on the school grounds simply as an illustration of what walls are.

Within the house or the office or the school building—almost any building in which people live and work—are found various pieces of furniture, in the construction of which another kind of woodworking is employed, requiring perhaps more exact methods of manipulation and fitting. This has been the field of advanced manual training and rightly so. A favorite project within this field has been a piece of furniture or a bookcase. Either of these is a significant project because it represents an important piece of the household surroundings. A large chair or a table is apt to be the more comprehensive since it involves not only fitting flat pieces of wood but also some turning, gluing, and finishing, and perhaps some carving. A bread board, a card receiver, an Indian club, on the other hand, is neither a significant nor a comprehensive project.

A very significant aspect of the environment which presses on the attention of the householder is the plumbing of the house which he and his family inhabit. An intelligent attitude contributes to his own satisfaction, to the health of his pocket, to his understanding of the sanitation problems of the community, and hence to his value as a citizen. In the field of general education,

the construction and installation of fixtures is probably quite as important as the technique of fitting pipes. Nevertheless, attention to manipulations like the latter is clearly essential to that understanding of the situation which amounts to a serviceable conviction. A significant and comprehensive project here would be setting up a water closet or a kitchen sink or a wash basin and connecting to both water supply and sewer. Learning how to wipe a joint would be neither significant nor comprehensive, though it might be an exercise in connection with the project proper. Arrangements for such projects in the shop itself can of course be made. In rural communities in which no sewers exist, study and installation of a septic tank could in principle very appropriately be made part of the project.

Akin to plumbing is steam-fitting, and much the same principles apply. The author recalls a school in which the boys in a shop course installed all the steam fitting in a newly constructed addition to the shop. Again, a significant and comprehensive project. It would have been entirely appropriate and feasible if the authorities had foreseen the need of the addition and had allowed the boys in the shop courses to erect the addition as a project in building construction, even though two or more successive classes had been engaged in the enterprise.

Kindred to plumbing and steam-fitting is the study and installation and repair of electrical appliances such as call bells, telephone service, and electric lighting. A significant and comprehensive project here would be the installation of a system of call bells in the schoolhouse or the overhauling and repair of the system in use; another would be the installation of telephone service in the schoolhouse or in part of the building; a third would be wiring and connecting up a lighting system.

In the preceding chapter, we have attempted a tentative analysis of the practical-arts environment, by no means complete, however, and have found therein certain of the major mechanical appliances of industry and the common life as significant factors. Among these are the gas engine, the steam engine, the water tur-

bine, the generator of electric current, the electric motor, systems of power transmission, and the automobile.

The automobile is, in a sense, an epitome of this whole field. It includes a typical power generator, a system of power transmission, an electric generator, an accumulator of electric energy, and an electric motor. Furthermore, it is in itself a most significant aspect of the practical-arts environment. It is then a comprehensive and significant project.

If we now take the gas engine, the steam engine, the turbine, and the electric motor as projects in succession, in each case belting the power to the electric generator, we shall have again a major project comprising four minor projects, the major project being essentially experience with the generation and transmission of power. Each of the machines representing the minor projects is taken down by the pupil, cleaned, oiled, assembled, belted to the electric generator, and put under its own power. It is then adjusted until the assembly is running smoothly. The turbine, if it is used, is specially designed to operate under a head represented by the pressure in water mains.

Now in the process of working upon these projects, and especially the automobile project, a very useful piece of experience is repair work and perhaps new construction. There is always likely to be an abundance of the former, especially in connection with automobile overhauling and repairing. As to the latter, a working electric motor is apt to be a useful addition to shop equipment or to the equipment of some of the homes represented. Similarly, a working steam engine is not too complicated for construction by boys in general-education courses. Not only do repair work and new construction afford useful assimilative experience in connection with the units already discussed, but they serve as appropriate starting-points for two types of activity which form significant parts of the practical-arts environment. These are blacksmithing and machine-tool work.

The simpler and more essential blacksmithing processes have no place in general education as trade-training but they are use-

ful as contributions to the building up of an intelligent attitude toward an important part of the industrial-arts environment. They bear much the same relation to the mechanical project which processes in woodworking bear to the house and cabinet projects.

Similarly, the use of the engine lathe, planer, milling machine, drill press, and grinder contributes an important element to the pupil's adjustment to his mechanical environment. Here, as in most other instances in this field, and more here than in any other perhaps, it would not be worth the while for any pupil to spend a single period in the machine shop "because he may need to use the knowledge." It is very much worth the while for him to pass through the experience for the sake of the enlightenment which he acquires concerning common experiences and contacts, which he is destined to encounter almost every day of his life. The individual who contemplates a revolving shaft and sees in it a piece of steel, only this and nothing more, is a personality essentially different from, and probably inferior to, him who understands its origin and purpose and senses that in case of need he could construct a similar one. The latter dominates and the former is dominated by the Machine.

In the foregoing discussion, we have attempted to illustrate the essential nature of the practical-arts project and to exhibit its relation to the true learning product as found in the practical-arts unit. The reader should understand that the projects suggested are suggested only for the purpose of illustration. Other means of educational access to this aspect of our common environment, other units, and other projects might be more serviceable everywhere and probably would be more serviceable in some communities. We are concerned here primarily with the organization of a possible teaching procedure. We have dealt only with the shop courses. The same principles will apply to the interpretation and organization of the practical-arts courses in domestic arts, and to courses in the pictorial and plastic arts as well.

Courses

From all the foregoing it follows that the customary organization of courses as carpentry, turning, bent-iron, tinsmithing, blacksmithing, machine tools, cooking, sewing, etc., are purely adventitious in character viewed from the standpoint of requirements in general education. If we desire to divide up the field for administrative purposes, the appropriate courses are Industrial Processes, House and Furniture Construction, the Principal Machines, Foods, Clothing. So far as the use of mechanical processes like carpentry, iron work, plumbing, enters the picture, as of course it does, it enters as means to educational ends and not as ends in themselves, as means of access to assimilative experience and not as teaching objectives. Courses in Foods and in Clothing are, as we have seen, only in part practical-arts in their nature.

II

CLASSROOM TECHNIQUE.—A needful preliminary to our consideration of classroom technique is perhaps to remind ourselves of the principle of initial diffuse movements as applied to the establishment of adaptations in the field of general education (see chap. x). We are dealing with large units and comprehensive projects. Our concern with them is that they shall contribute to genuine growth in the pupil, not that the pupil shall always do a mechanically perfect piece of work. As the practical-arts course goes on, the pupil will naturally eliminate many of his cruder and more illy-directed movements in favor of relative precision and economy. Many teachers of the practical arts, especially if they have been recruited from the field of the trades, tend to reverse the process and attempt to develop mechanical skill first. The end is pretty apt to be that courses so conducted appeal only to pupils who are disinclined to use their minds or who perhaps have but a slender mental equipment to use. At the best, the outcome will be only mechanical skill, which in most cases is not the objective, and an educational result by chance if at all.

On the other hand, there is of course no justification for using the fundamental principle to which we have appealed as an excuse for negligent and slovenly work. Practical-arts projects, like study in the science-type subjects, should be used as instruments for severe intellectual training in competent and respectable methods of work. The point at issue can perhaps best be seen in concrete illustrations.

A young boy who is nailing up a piece of woodwork will usually fail to hit the nail squarely, and, as a consequence, before it is driven home, the nail is bent. The pupil then hammers the bent portion flush with the wood and repeats the process later with other nails. The result is of course not merely an unworkmanlike job, but a slovenly piece of work. If allowed to establish a tradition of such work, the boy's conduct development is not furthered and a contribution is made to the arrest of development at a childish level, which we have discussed at length in chapter xx. The instructor invariably requires the pupil to draw the nails and to do not a perfect but a right job. If this part of the project is ruined, the pupil has to go back and begin over. Now, the teacher whose mind is obsessed with the thought of a perfect mechanical product rather than occupied with the purpose of developing the boy will not allow the pupil to work on a project at all until he has learned the art of driving nails correctly.

Again, in fitting two boards, it is necessary to saw accurately to line. Otherwise, the joint will not close and the whole project, it may be, fails to function. Now the natural boy will not saw to line, partly because he has not learned how but largely because he will not make the effort and will not concentrate. The task of the instructor is to convince him that he must saw to the line, not only in this case but always. To do so is to work at mastery level. Incidentally, the practical-arts teacher who is an educator seizes the opportunity to generalize the training and establish a transferable ideal. In brief, he seeks to convince the pupil that sawing to the line is an essential guiding principle in all school life and in life in general. Thus does the pupil take a step in conduct devel-

opment. The formalist, on the other hand, will not allow the pupil to work on a project at all until he has learned to make joints accurately.

It will probably be objected that, unless the pupil is trained to accurate work as a preliminary, he will ruin a lot of valuable material. The answer, of course, is that he should not be given projects in mahogany until he has matured to the point at which he can be trusted to deal with that kind of material. If he never reaches that point in his general education, it does not matter. A mahogany study chair skilfully executed makes an imposing exhibition piece, but it reflects a product in pupil development which may have been gained at a cost altogether out of proportion to its value in education.

A second preliminary warning in developing the principles of teaching in this field is contained in the reminder that practical-arts courses in the shop, in the woodworking and blacksmithing activities in particular, are also manual-training courses. The farther the school is from abundant opportunities for manual work in the home and in the community, the more does manual training loom large as a valuable and necessary developmental activity. Now, planing and sawing and hammering constitute the chief manual-training activities. Wherever the teacher, with an eye to the mechanical rather than to the human product, introduces the power jointer or saw, he deprives the pupil of a very important element in the value for which the course stands. It is no rejoinder to assert that the modern carpenter shop has replaced many of its hand tools with labor-saving machinery. General education is not using the woodworking shop for the production of carpenters but for the development of boys.

It is not ordinarily practicable for pupils to work together on the same project unless the latter is a large one containing operations which occur many times, such as, for instance, a substantial house project. To put several pupils together on a project is apt to mean that no one of them will acquire the round of experience for which the project stands. In the few instances in which sev-

eral, or perhaps a whole section, work together, the conditions of course resemble those under which a working gang of men operates. In working individual projects, there is no hard-and-fast sequence, although of course the younger pupils do not begin in the machine shop, not because the woodworking projects are necessarily pedagogical prerequisites to the metal-working projects, but because the latter require greater maturity both of judgment and of volitional capacity. In domestic arts and agriculture, and indeed in most practical-arts courses other than shop courses, many pupils can be working upon the same project at the same time. In the shops, the necessary duplication of apparatus would in most cases be altogether too expensive.

The course has then been organized in unit form and the appropriate projects associated with the several units. There thus appears a course outline which can be mimeographed and placed in the hands of the pupils or printed on a chart and placarded in an appropriate place in the shop or domestic-arts laboratory or the classroom in agriculture. We thus come to the systematic teaching procedure which has much in common with that of the science type.

Pre-test in practical arts.—The pre-test member of the mastery formula cannot be safely, or at least economically, ignored; but the testing procedure is adapted to the nature of the course.

The needs of the pre-test are satisfied when the teacher has become aware of the pupil's present experience and knowledge in the unit which the latter is about to attack. In some cases the teacher will be sufficiently familiar with the out-of-school life of the pupil to form an entirely valid notion of the latter's apperceptive background. This boy, for instance, is the son of a carpenter and builder, and he is known to be actively interested in his father's calling. He is released. Another pupil the teacher knows never to have had the slightest contact with anything implied by the unit. Others are quizzed in individual conferences. As the course goes forward and the teacher becomes better ac-

quainted with the practical-arts side of his pupils' lives, the pre-tests on successive units practically administer themselves.

In other courses, and in some shop courses it may be, pupils will be working the same unit at the same time. In that case the pre-test is the exploration of the science type.

Presentation.—For each unit and project in the shop course an extended set of mimeographed instructions is prepared, or, if a suitable textbook is available, that is placed in the hands of the pupils. Now such instructions essentially correspond to the presentation in the science-type unit plus the assimilation guide sheet. They might be given up in favor of an oral presentation except for the fact that such a presentation would be required for each pupil. At times when all work on the same project at the same time, the regular science-type procedure of oral presentation is followed.

In the matter of instruction sheets, it is important to note that they should constitute a real presentation of the unit as well as a guide sheet for the project. Teachers sometimes furnish simply explicit guide sheets for the project in which the entire operation is detailed from step to step. In such cases, the pupil of course tends to become merely a laborer following out instructions which leave little opportunity for reflection. In the automobile unit, for example, the proper presentation is something after this fashion. Attention is called to the less obvious aspects of its place in social and industrial life. Its rapid evolution as a mechanism is noted. Its peculiar availability for the service it renders is set forth. (The teacher bears in mind that in most schools today the pupils have had no experience with a motorless age.) Its singularly comprehensive character as a machine is noted. Its essential features are then explained in order, and the vital parts of its upkeep, such as lubrication and care of valves, of the ignition system, and of the electrical parts, are enumerated. Easily understood drawings with a minimum of detail are either included or else reference is made to easily accessible charts or drawings in books. In

the end, the pupil should have in mind a clear and reliable sense of the unit and of its import.

Before proceeding to the project, the necessary presentation test is administered. This may be either of the two forms described in the chapter on exploration and presentation (see chap. xiv). On the whole, the written presentation test is to be preferred for the sake of its marked effect in compelling intellectual exertion. Whichever form is used, the pupil's reaction to presentation is not accepted until he shows evidence of having thoroughly read and digested. If a test paper is submitted which does not indicate mastery of this part of the instruction, the pupil is told to read again and get the meat of the matter, although of course not all the details. The immature boy, here as elsewhere, is prone to half-read instructions, and every opportunity is seized upon which will enable him to acquire a sense of work thoroughly done.

The guide sheet for the project should indicate what is to be done, but not how it is to be done. It should contain lists of appropriate reading material and references to charts, working drawings, book material, and the like, but not such directions as "Read pages 54-59." In brief, the pupil is placed in the presence of his project with the background of his presentation sheets and abundant collateral sources of material, but he is then expected to work for himself and by himself. Exercises are indicated; e.g., "Before trying to fit shelves, you will need to practice with the mitre-box until you are sure you can use it accurately for the purpose intended. Use scrap pieces of board."

Assimilation.—The practical-arts project corresponds to the assimilation period in the science type and much the same technique is followed throughout. The same cautions are to be observed concerning the tendency of pupils to sponge. The same check and training on sustained application are required. The problem case and corrective procedure are essentially the same. The testing is different. The teacher has before him a typical supervised-study problem. Not only the work but the mind of

each pupil is to be followed. The requirements can perhaps be made clearer by visiting first a poorly supervised room and then one which is well supervised.

The first is a forge room. We note on entering that the air is a haze of smoke traceable to poorly-made fires and neglect of drafts. Pupils are coughing in an atmosphere of sulphur fumes and the coughing is rapidly becoming hilarious rather than physiological. There is a clatter of tools being dropped upon the floor. One group is skylarking. As soon as we can locate the teacher, we note that he is feverishly trying to regulate a fire while the pupil concerned is standing listlessly by and contemplating the process. Presently, the teacher desists and shouts, "Tom, get to work on that job." He rushes to the next boy and mends the latter's fire. He then grasps the tongs from another, seizes an overheated piece of iron, and furiously hammers it on the anvil. And so it goes. Investigation shows that the shop is being conducted on the exercise basis. No one of the boys has any notion of what it is all about. There has been no presentation and there are no guide sheets. The teacher did, however, give a brief demonstration yesterday, and if we had been present we should have seen a group of fifteen boys huddled about a forge and anvil, the rear ranks vainly attempting to get a glimpse of the process over their classmates' shoulders. In a brief conference at the end of the hour, the teacher wipes his brow, shakes his head dubiously and remarks, "These boys do not seem to be able to concentrate."

We next visit another school and find a general-shop room. Here are carpenters' benches, a few wood lathes, a half-dozen blacksmithing outfits, a glue outfit, a tinsmith's bench, and an outfit of breast drills. Fifteen boys as they enter rapidly get into jumpers and overalls and attack as many different projects. The teacher is a quiet young man who has taken position near his desk and his own working material where he can see all that goes on. Every boy in the room is busily engaged on his own task. There is no "visiting," but occasionally two boys seem to be comparing notes. Presently, one of the boys leaves his project, crosses the

room, selects a volume from the bookcase, and seats himself at a long study table. He makes some notes and a rough sketch and after a time returns to his work. Meantime, we hear the teacher call out, "Better start that again, George." A boy comes to the teacher and remarks, "I think I am all through on Unit VII (or it may be Project VII), Mr. ———." "All right," returns the teacher, "I will inspect and let you know tomorrow. Here are the instruction sheets for Unit VIII." This boy spends the remainder of the period at the reading table. Another announces that he would like the teacher to look over his work since he is approaching a critical point. The teacher accordingly steps rapidly across the room, inspects the project, and we note that there are three minutes of brief conversation. When the teacher returns we inquire, "How was it?" "Pretty good," is the reply. "He will have to go back over a part of it." Toward the end of the period, a boy presents himself and remarks, "I am ready to learn how to make a weld, Mr. ———, and I guess Frank is too. We have read up on it and we think we see how it is done, but we should like a demonstration." "All right, can you and Frank and John and William come in for a little while this afternoon?" "Yes, sir, I guess so." "But," we inquire, "are these boys willing to come back for after-school work?" "Yes, this place is open till five every night for voluntary work and two-thirds of this class is usually here. Ordinarily, I give a demonstration during the class period, but this is rather a particular piece of work, and it will take some time. As long as the boys are willing to come, I prefer to make it an after-school affair." Before the bell rings, the teacher calls another boy to him and bids the latter be present after the session. This boy looks grieved.

We are glad to return at 3:30, and, as the teacher anticipated, the greater part of the class is present. We are curious to follow out the story of the reluctant pupil and so we listen to the colloquy. "James, you are badly behind with your project. Do you know why?" "Don't work hard enough, I suppose." "It isn't so much that as that you don't know how to work. You dawdle and will not stick to your job. See, this is how you work [application

profile]. I have talked to you once before about this. I have had a talk with your father, and he agrees with me that the most important thing for you is to learn what work means. See, here is a picture of Frank at work, and Frank is here voluntarily. He is enjoying work and as soon as you become willing to apply yourself, you will enjoy yourself too. So you are going to work overtime until you have got into the habit of making a good work profile. It is up to you."

Meantime, the four boys in whom we are specially interested have started four forge fires. The teacher sits down with them and quizzes them for fifteen minutes on the process of welding. In the end he is satisfied that all four are thoroughly aware what the process is and in general how it is carried out. He then gathers them about a forge and makes his demonstration, talking as he works. After a few further questions on the part of the boys, each takes some scrap and goes to work. The teacher stands back and watches them. Very little is said until the job is done. We note particularly that the teacher does not keep up a continuous flow of advice, instruction, and interruptions. When the boys have finished, there is a period of perhaps ten minutes of discussing the work and then all four boys repeat the process, and each makes an acceptable weld.

Such is the difference between a good technician and an incompetent teacher. "But," the reader may remark, "you have simply pictured the difference between a hopeless rattle-brain and a strong, capable man." Not at all. We have contrasted a man who is willing to work systematically, thoughtfully, and with due self-control with another who is not willing to make the effort. The inadequate, incoherent person whom we found in the first school is not essentially different at bottom from the boy whom we found in the second school under special training for lack of sustained application.

TESTING.—In our description of the work of the second teacher we have suggested the application of the mastery formula to project work and likewise the application of assimilation testing. As a matter of fact, in practical-arts teaching both are largely

self-applied. The student who is working on a project and finds that what he has done does not work out according to the picture which is in his mind is naturally inclined to revise his operations and try again. The teacher may in many cases be obliged to hold students up to high ideals of effort and persistency; that is part of their training in conduct. He may at times need to make suggestions as to the seat of the trouble which the student is finding it difficult to locate, but, if he takes over the project for the time and locates the student's difficulty for him, he deprives the latter of any real educational product. If the presentation has been thoroughly done and tested, and if the instructor has seen to it that the shop is furnished with an adequate working library of books and other collateral material, it will seldom be necessary even to suggest. Here, as elsewhere, in study periods, the most obstinate learning products are the development of sustained application and the convincing of each pupil that he can and must work out his own salvation.

The final assimilation test is the inspection and acceptance of the completed project, but such is not the unit test. Be it remembered that the practical-arts unit objective is intelligent attitude. The working of the project is a performance which must itself be checked up, but, after all, the project is only an experience out of which, in connection with the presentation and more or less collateral reading, intelligent attitude may or may not arise. In the end, the unit test is precisely similar to the unit test set at the end of the assimilation period in the science type. Like the latter, it is well to submit the student to an exploratory unit test comparatively early in the project or assimilation period in order to secure a basis for corrective teaching. Otherwise, the pupil may come through to the end with non-mastery, and in that case the unit has to be attacked anew with a second and different project. Of course a waste of time and motivation is thus incurred which might have been avoided by adequate follow-up and re-teaching.

III

ADMINISTRATION OF PROJECTS.—As we have already noted, some practical-arts courses are of a nature which permits all pupils to work on the same project or equivalent projects at the same time, while others do not admit of such treatment. Others still admit of either treatment. Again, practical-arts courses, like others, are susceptible to an indefinite amount of voluntary enterprise study. The latter may be in the form of additional projects, or in the form of extended investigations in the library. On the whole, in the field of general education, the latter are probably to be preferred in most cases.

When the course is of such a nature that purely individual work is done, administrative problems arise which require a more or less abrupt departure from standardized notions of administrative routine. Apparatus is expensive, and enough of it to provide every pupil with equipment whenever he needs it would require an unreasonable amount of floor space. Nor is the latter at all necessary or even desirable. While units, and the projects under each unit, should be listed in convenient order, it does not necessarily always follow that all pupils should begin at the same point on the list. Again, it is often possible and even desirable that several pupils who are working on the same unit shall work on different projects, all of them focusing on the unit. Finally, in courses which are carried as strictly individual work, it is not essential that pupils shall end the course or even begin it at the same time. A typical arrangement may be pictured somewhat in the following manner.

The course is organized in units and posted. Under each unit, if more than one project is possible, several are suggested. Instruction sheets and guide sheets are made available and stored in a case accessible to all pupils. The instructor has prepared a master-sheet on which the names of the pupils registered appear in a column to the left, while the unit titles or numbers and projects are carried across the top. The sheet is then ruled in rectan-

gular form. As each pupil completes a unit, he is checked in the appropriate square or squares.

Now, as soon as the class lists are prepared, the teacher, the head of the department, and perhaps the principal's office confer. Pupil A is known to be a slow worker and something of a problem case though in no sense remedial. Pupils E, M, N, O, S, T, and W are in varying degrees much of the same order. All are notified to meet the practical-arts teacher on the day scheduled for opening. Pupil B, however, is known to be relatively well equipped already, and will probably be released on one or more of the units. His beginning is deferred for three months, and he is advised to throw himself with special energy for a good start into a language course in which he is likely to be weak. Pupil C will probably work effectively and need little corrective teaching, but practical-arts work is new to him. His beginning is deferred for one month. Several others are treated on like grounds. As the course develops, Pupil E exhibits special talent and completes the course early. Pupil B exhibits strong inclination for voluntary enterprises, and, in spite of the fact that he is released on several units, the succeeding class has entered upon the course before he finishes. Pupil C makes up his month and finishes early, but he does no voluntary enterprises; his chief interest is in history. Others finish at different times, but Pupils A and B for different reasons run over the normal time allotment.

While we have drawn our illustrations largely from the shop courses, the principles apply equally to all others which are practical arts in their nature. The teaching may be concerned with agriculture; with cooking or dressmaking; with accounting or office practice; with drawing, design, or modeling. The characteristics of all are: organization in comprehensive and significant units which can be mastered as intelligent attitudes; the selection of significant and comprehensive projects which focus upon the several units; insistence upon creditable performance in working the projects; effective testing and follow-up; and finally testing for the learning products implied.

CHAPTER XXIII

LANGUAGE ARTS

THE five types of learning which we are considering in this part of our study have much in common, but for practical teaching purposes the differences are much more important than the similarities. The type which forms the subject matter of this and the two succeeding chapters is distinctly the most pronounced in its peculiar characteristics, and successful learning in the subjects which belong to the type is more critically dependent upon accurate recognition of the learning peculiarities involved than is the case in any of the others. It has to do with the art of getting thought content or some other form of impression from running discourse of some sort, and with the art of giving expression to one's thoughts or emotions in the form of discourse. The type includes not only reading and speaking and writing in language, but such kindred learning objectives as musical and dramatic expression. In fact, wherever the discourse element is present, we have the critical differential which marks off the type. The name "language arts" is chosen, not because the learning is limited to linguistic expression and impression, but rather because the pedagogical problem involved is most commonly found in the school languages. In developing the type we shall study the teaching of languages, but teachers of other subjects, such as the various forms of musical expression which belong to the type, will be able to understand the principles set forth and apply them in their own special fields.

I

NATURE OF THE LEARNING PRODUCT.—The learning product in the language arts is always an ability to read or hear or feel a message expressed in some form of language, or else an ability to

use some form of language to express thought or feeling, without in either case focal consciousness of the discourse itself. Thus, the learning product is an adjustment in the form of *ability* as distinguished from *attitude*, which we have found as the learning product in the three types thus far studied. Such ability we shall term generically a language-arts adaptation. We have already found it in the primary reading adaptation discussed at some length in our chapter i. There the child comes to the point at which he sees through the printed page to the message beyond, much as a person gazes through a window to the view outside without consciousness of the glass. In the same sense, the pupil who has learned to read French without translating has attained a reading adaptation in French. He no longer picks his words but looks through them to the message which the complex of the words conveys. Again, the person who writes his vernacular for the purpose of conveying a message to others does so without consciousness of the words he uses. He does not fit words together in a sort of discourse mosaic but rather the words fall into their right places while his mind is centered on the thought which he wishes to express. He becomes conscious of what he is writing only when an occasional right word fails to drop into place. Using the same terminology, we may call this objective the written-expression adaptation. Once more, the musician can express the feeling which he wishes to arouse in his audience only when he is no longer obliged to pick his way over the keyboard or strings.

It is important to discriminate between the reading adaptation and certain other arts sometimes acquired.

The most obvious is the so-called translation ability, in which the pupil learns to use a lexicon in one form or another for the purpose of turning French for instance into a sort of French-English. He may retain in memory enough word meanings so that he becomes a veritable briefer lexicon in himself. In a clumsy and awkward way, he can thus contrive to decipher the meaning of the page. He is not reading but deciphering, not translating but "transverbalizing." He may indeed become so

skilful that he carries on the process rapidly but he is still deciphering and not reading.

Students of language are universally agreed that a meaning expressed in one language cannot accurately be expressed in another by this process which we have called transverbalization. Every people has its own peculiar thought processes which are faithfully reflected in peculiar forms of expression. The pupil who learns to read and reads a great deal comes to sense these peculiar meanings. To some extent, he enters into the spirit of the other people and indeed this is in itself an important educational objective. The artist who is a master of both the foreign tongue and of English can indeed translate, but he does so by catching the thought expressed in the foreign tongue and then endeavoring to express the same thought as the English-speaking person would express it.

As we have seen, the test of the reality of a learning product is its habitual use and permanency. Neither the deciphering ability nor the school translation ability is likely to become a real product for the reason that use is too difficult. Nobody is likely to use the foreign tongue habitually in that way unless he is under some strong motivation, such for instance as employment as a translator. On the other hand, one who has learned to read the foreign tongue in the same sense as that in which he reads his mother-tongue is apt to be reading in both, as interest or entertainment dictates.

Similarly, the fundamental objective in English writing is the ability to express one's self correctly and with facility. Now this seems to be a unitary adaptation like reading ability. The experiential process through which he has attained the adaptation may have been a complicated one in which there are many elements, but in the end the pupil habitually expresses himself clearly and in conformity to conventional usage or he does not. The contrasting situation is that in which the individual simply does not bother to express himself other than in a semi-illiterate manner. He seems to have no sense of his spelling, his punctuation,

and his sentence structure as factors in the expression of his meaning. Now, it is quite true that the person who possesses a sense of correct writing is occasionally guilty of lapses. Probably everybody has such experiences. But there is a wide difference between him who fails to catch an error in proofing his paper and him whose papers are a mass of illiteracy, who never proofs his writing, and possesses no sense of the need of doing so.

Again, stenography is distinctly a language art. If the correct learning product is established, the writer employs his symbols to express meaning and in taking down dictation his attention is focalized on meaning and not on his symbols. Unhappily, we frequently encounter stenographers whose attention is typically focused on successive words, and as a consequence our dictation comes back to us more or less a mass of meaningless gibberish. To such an operator, a meaningless sentence is apparently not offensive, while to one who possesses the true learning product a meaningless sentence is evidence that there is a mistake somewhere. The competent stenographer has, like other true language learners, learned his words from their meaning in sentences; the other attempts the almost impossible task of constructing sentences out of words learned in isolation.

The teacher who has here the fundamental objective in view all the time adjusts instruction, course content, and assimilative practice to the end in view. He tests with reference to the end, studies defects in the learning process, and corrects them with the objective in mind. Again, this is the essence of direct teaching. The teacher does not give a course in grammar and then one in usage and finally one in rhetoric, in the expectation that automatic transfer from performance in these several courses to the ability and the attitude which spells habitual correct writing will later take place.

II

SUCCESSIVE ADAPTATION LEVELS AND ASSOCIATED SKILLS.—In the language arts, more perhaps than in other fields, it is essentially important to distinguish between the fundamental

learning products on the one hand and successive masteries and the associated skills on the other.

In the case of habitually correct writing, we have an instance of a fundamental learning product. For purposes of general education, that is as far as the individual need go. Some individuals, however, either because they become interested in writing as such or because vocational needs require it, go on and develop masteries at the levels of stylistic accomplishment. This person, for instance, develops an expository style; another acquires the style called for by good journalism; still another that which makes him a successful writer of novels. These additional attainments are characteristic of the persons concerned as individuals; we soon turn away from the writer whose style is a purely conventional affair. The attainments are adaptations in the same sense that the fundamental learning product of correct writing is an adaptation.

On the other hand, facility may be built up on the basis of any of these adaptations. This high-school pupil writes correctly, and he writes rapidly and fluently. His vocabulary is flexible, and he manages involved sentences well. Another writes slowly, laboriously, and with a restricted vocabulary, but he writes correctly. As far as the fundamental learning product is concerned, the two are on the same level, but one has acquired facility while the other has not.

Again, two pupils have alike arrived at the reading adaptation in a foreign language. Both show the characteristics which the latter implies. But one of them reads rapidly, and, if tested, shows a high rate score, while the reading of the other is slow and his rate score is low. Both have arrived at the fundamental learning product but they differ, perhaps widely, in skill.

Now the teacher and the school not infrequently center attention either upon skill or upon the rudimentary appearance of what are in reality successive masteries so that the true learning product is lost sight of, with disastrous results. The school is so interested in evaluating educational results in terms of the rela-

tive attainments of different pupils, that most pupils fall into the chasm of no genuine attainment at all. The teacher notes that A shows considerable facility while B shows less. As a matter of fact, both are on their way to the mastery contemplated by the course or sequence of courses, but neither has arrived. C shows signs of what may turn out to be budding literary genius but he habitually writes with scant regard to the requirements of correct writing. D, on the other hand, shows no literary promise and writes as correctly as C. C is accordingly graded higher because the remotely possible literary genius he displays seems to "require recognition." In the end none of the pupils acquires the adaptation in terms of which he habitually uses correct English.

In the process of attaining a language-arts adaptation, whether it be the primary reading adaptation or a stylistic level in specialized university courses, elements of skill begin to appear at once. Judged by performance, the pupil is improving. He continues to improve in skill along the line of the characteristic learning curve up to and through mastery of the learning unit, but there is no evidence, from scores which reveal improvement in skill, when the adaptation has been made or that it has been made at all. Evidence of the latter must be sought in other directions, for instance in the characteristic eye movements of the reading adaptation. A rough method of identifying the presence of the adaptation in a reading course is to note when the learner begins to read voluntarily upon exposure to attractive reading material. Overlooking the principle just set forth leads backward into a common form of lesson learning, in this way.

The teacher has no specific objective in mind, but only relative degrees of skill in different performers; but there must be some standard of performance. What shall it be? There are two possible answers. We may go back to our system of passing grades and fix the standard at the score achieved by the poorest performer of that group which we feel obliged to pass, or we may set a standardized test and select as passing performance the score achieved by some statistically selected median pupil which be-

comes the norm. In neither case does the passing grade of performance bear any relation to the attainment of a language-arts objective. On the contrary, the standard set either by the passing-grade method or by the standardized norm throws us back into a situation in which the adaptation will not be attained except by a casual few.

It is nevertheless always possible to keep track of the true learning product by observing the pupils in their progress toward it and by identifying the point at which it is attained. The time comes when we may say with confidence: A, B, and M have learned to read or write in the true sense and they need continue in this course no longer; C, D, and N have not reached that point and they will need further experience.

III

THE TYPICAL INHIBITION.—Language-arts learning, like learning in other types, is possible only when its own peculiar learning conditions are satisfied. The tendency of schools is to reduce all learning to a crude science-type process. The effect upon subjects which belong to the appreciation type or to the practical arts is to make the learning product nil, with or without inhibitions. The effect upon subjects which belong to the language-arts type is systematically to set up actual inhibitions of a peculiar and characteristic type. We shall call them generically the *language-arts inhibition* and adopt the term into our terminology.

The set of reactions which either learning or use of a language art requires takes place in a situation whose characteristic is running discourse. The mind has no chance to pause for conscious reflection from word to word, although it may, of course, pause for reflection upon the content which is contained in the discourse. Any such pause, if it is a part of the learner's method, generates the mental set to which we have applied the term used in the preceding paragraph. If a learner in a foreign language, for instance, thinks to himself, "This word means —— and

this one I must look up; this word is probably a subject because it is nominative and the exact meaning of this verb is continuing past time because it is in the imperfect tense," he proceeds haltingly and after long and laborious effort builds up a deciphering, transverbalizing ability falsely called translation. If now we take such a pupil and try to teach him to read, we find that he has the characteristic mental set which has grown out of his learning experience. He is looking for words and other isolated elements and even a slight appearance of unfamiliarity causes him to balk. Those of us who have learned to read encounter a great many unfamiliar words even in maturity, but we read over them to the meaning of the passage as a whole. Usually the unfamiliar word slips into its place from the meaning of the context. If not, we do not stop until the meaning of the passage as a whole fails to clear up, and then we go back and investigate the unfamiliar word. In other words, we read for meaning, and isolated elements fall into their places in the whole complex which constitutes the meaning of the passage as a whole.

The language-arts inhibition in foreign language is chiefly traceable to the grammatical daily-lesson type of approach. The latter attempts to teach a language through the application of science-type principles to a discourse situation. It rarely succeeds and then only in a casual and uneconomical way. We occasionally find a student who has been given long training in the ordinary grammatical approach, acquiring thereby only the ability to decipher with the aid of a lexicon, and whose language needs call for the reading adaptation. In such cases it commonly happens that the language-arts inhibition must be broken down by remedial treatment. In some way, he has to be led to "let himself go" and disregard the errors he may make in his seeking rapidly for a sense of the meaning of the passage as a whole, re-reading rapidly several times until the meaning begins to come clear. It is interesting to watch such a remedial case and note the persistence with which the language-arts inhibition holds on. The pupil has been convinced of the nature of his difficulty and

has seen clearly the way out, but if we watch him at work we shall see him guiltily and furtively turning to his lexicon for the meaning of an unfamiliar word. For some time he simply cannot get over the malevolent insistence of that old mental set.

The corresponding situation in English expression is commonly found rather in the primary than in the secondary school. The young child is natively extremely voluble. Apparently this is nature's method of giving him sufficient assimilative practice for the needs of his developing power of expression in language. If allowed to have his fling at home and school he is no doubt tiresome to his elders, but he grows. By the time he has reached the school age he has learned to tell a connected story, but he is extremely prolix. Little by little his stories become coherent and he takes on a certain charming individuality in what he has to say and in his manner of saying it—provided parents and teachers are possessed of unusual patience. Let the child grow up in this way and we are quite likely to find an adult whose language is, to be sure, devoid of conventions but nevertheless graphic and forceful. We find individualistic ways of looking at things joined with quaint and apt forms of expression. In the highly artificial life of complex society we are more likely to meet such people in secluded and somewhat remote corners than in the standardized life of the city.

But our loquacious child seldom does have his fling. In the home he is suppressed, and in the school he is not only suppressed but there are inflicted upon him unended series of language "don'ts." The result is familiar: the child will say little in the schoolroom and will write less. Whatever he has to say must express some form of school convention rather than a meaning sensed and recognized by himself as meaning. The pupil is a mass of language-arts inhibitions.

There is a somewhat similar situation in high school and college, where good performance in a composition class refuses to transfer to ordinary writing, although the lesson-learning element is apt by that time to have also become influential.

In general, wherever in the learning of a language art the learning process focalizes consciousness upon isolated elements of the discourse situation, the language-arts inhibition tends to be set up.

IV

ASSOCIATED LANGUAGE OBJECTIVES.—In the courses ordinarily listed as language courses there are commonly to be found objectives which are not of the language-arts type. There is at least grammar, or the study of language structure, and some portions of the literature. In foreign language in the high school all three elements are likely to be found mingled in the same courses, except that the literature is not often found in the first course. The objective of the school either announced or implied is learning to use the foreign tongue.

Now here are three widely different types of objectives, each of which if brought into the same learning situation with the others tends at the best to throw the purpose of teaching out of focus and at the worst to set up inhibitions.

We have discussed elsewhere the legitimate and proper function of grammar as part of the educational equipment of the individual in any language. See chapter xiii, page 234. If it is desirable to give the learner that independent critical command of the language which grammar implies, then let us organize a course in the essentials of grammar and offer it to pupils who have attained the reading adaptation.

Much the same sort of situation arises in the case of literature, using the term "literature" in the sense of *belles lettres*. The proper educational objective here is the cultivation of taste through the formation of adaptations of the appreciation type. Now most such reading material is a highly developed type of expression which makes of it very poor assimilative material for the purpose of attaining the reading adaptation. If the pupil gets the sense, he must read laboriously with much analysis and frequent use of the lexicon for the interpretation of a highly developed vocabulary. The result is the accumulation of the familiar

inhibitions in reading and corresponding inhibitions on the appreciation side. The extreme illustration perhaps is the use of Caesar's *Commentaries* and the orations of Cicero as vehicles for the development of reading ability in Latin. We should hardly place the Civil War history of the Count of Paris in the second grade, or the speeches of Daniel Webster in the third grade, for the purpose of teaching children how to read English. Most high-school courses in French or German show much the same kind of misinterpretation of the pedagogical situation, though perhaps not to an equivalent degree. The English department meets the situation by placing its courses in literature at levels which are much later than that of the attainment of the reading adaptation. Indeed it goes farther than that, for it does not attempt to use a particular piece of literature in its courses until the pupils are presumably sufficiently mature, both intellectually and socially, to form the adaptations which the literature implies.

An element of confusion is sometimes introduced in thinking out language-arts pedagogy through confounding reading which implies other learning products than those of the language arts with the fundamental reading adaptation. For instance, here is a pupil who reads readily books in elementary science and he is adjudged therefore to be a better reader than his schoolmate who reads readily only matter which is entirely non-technical. Not so: the first has simply acquired a set of understandings which enable him to get the sense of the science, while the second has not done so. There is not necessarily any difference in their reading ability as such, either in respect to the fundamental adaptation or in respect to such associated skills as high rate and assimilation power. No amount of training in reading, apart from training in the subject matter read, would improve the specific reading ability of the second. The comparison will stand for many similar instances found in the language-arts field both in the secondary school and in the university.

A student, for instance, has learned to read German. He now has occasion to read scientific German, in the field, let us say, of

chemistry. He does not succeed, and either one of two reasons may be the explanation. The more likely explanation is that he does not know his chemistry with a clarity which is sufficient to enable him to read into the text the unfamiliar phraseology. If he knows his German, he of course needs an illuminating glossary of the technical terms and phraseology in their German use. In either case, the problem is a chemistry problem and not a language problem.

Similarly, a student may have the undoubted ability to read French. He presently finds himself in a course which requires the reading of diplomatic documents. He soon encounters the same difficulty which his fellow-student has found in chemistry; he is not sufficiently familiar with the course content even in English and he probably lacks the needful glossary.

Turning to the field of written and spoken English expression, we encounter the same set of phenomena. In a specialized field, the student stumbles in the use of the appropriate terminology. The young pupil in the secondary period is prone to attempt to meet the difficulty by the use of such expressions as "that thing" and "that way." The older pupil who is suddenly introduced to a course in which the books use the severely technical terminology at first balks and then falls back on the lesson-learning attitude.

These illustrations are cited primarily for the purpose of making clear the distinction between what is a language-arts problem pure and simple and situations in which a language-arts problem is complicated with subject-matter and study problems. The practical solution, however, can be summarized by pointing out the principle that teachers of science-type subjects have language-arts problems in the whole field of the development of study abilities, problems which they can solve and which cannot be solved economically and satisfactorily by giving special courses, either in "reading science" in the elementary school or junior high school or in "scientific German" or "diplomatic French" in the university. If a foreign language is concerned,

the problem becomes one of specialized thinking in the foreign tongue. The appropriate course to take is to recognize the distinction between general education and specialized training and to see that all pupils in the secondary period have an abundance of material in science-type subjects in which the use of professional terminology is reduced to the lowest terms consistent with clear thinking.

V

BASIS OF OPERATIVE TECHNIQUE.—Before going on to the consideration of the specific technique in the language-arts fields most commonly found in the secondary school, it is perhaps well to survey the learning process in its more general aspects, and particularly with reference to the peculiar importance of the law of initial diffuse movements.

The principle seems to apply in this type more critically than in any other, save perhaps that of pure practice. That is to say, the learner acquires the learning products most economically, most efficiently, and most abidingly by keeping his mind off his mistakes in the early stages of the learning process. What is meant can perhaps be made clear by concrete illustrations.

The infant in acquiring some of the early and fundamental adaptations is perhaps more definitely in a "state of nature" than is ever the case in the schoolroom. Inhibitions are not set up, simply because the parent cannot make her instructions register even if she desires to do so. The baby in his thirteenth or fourteenth month who is arriving at the walking adaptation would not heed specific instructions from his mother even if she were to give them. No use to try to teach him to "walk right from the beginning" by pointing out his mistakes. He goes his own way anyhow and achieves a very satisfactory success. He creeps about the floor in his own individual way. He draws himself up to a chair and goes stumbling about in an unco-ordinated sort of fashion for some days, every muscle in his body discharging itself quite without regard to its ultimate place in the neuro-muscular complex which we call walking. Little by little the random

movements disappear and in a few weeks he toddles about the house in substantial independence. He has reached his walking adaptation. As body and limbs grow stronger, he comes to exercise an agility at which most older people marvel and which they envy.

So it is with talking, eight months or so later. After a long period of babbling which is perhaps little more than the reflexes of auditory sensations, he comes to the point at which he is conscious of a simple message which he wishes to communicate. An incoherent stream of sound issues. We are conscious that he is trying to say something. He is encouraged and little by little his messages begin to take shape and eventually his verbless sentences appear, sufficient for present needs. He uses the infant *patois* or baby talk, but still he can talk. As experience expands and the content which he wishes to communicate becomes itself more complex his means of communication keep pace. His skill on the level of the talking adaptation improves. Under favorable conditions it continues to improve into middle life or later.

Now, if we could divest ourselves of our own experience in this kind of learning and view it in a purely objective way, as perhaps a visitor from another planet might view it, we should probably be astonished at the learning which the infant achieves and the brief time in which he achieves it. No courses of three or four or five years for learning to talk, but rather scarcely more than as many months, after the learning process as such has actually begun.

A somewhat similar situation seems to have existed in former days when white men were frequently thrown into contact with savage peoples. Here was foreign-language learning without either grammar or beginner's book indeed. Nevertheless, the castaway sailor or the lonely missionary contrived to learn the language. Much the same situation reversed was found when the stranger in our midst came among us with a tongue as wholly unknown to us as ours was to him. No interpreter and yet in a surprisingly short time he learned our language. How clearly

there come back to some of us his painful and incomprehensible attempts, his later grotesque misapprehensions of single words and his perversion of all grammatical principles. Nevertheless, he contrived to make his meaning perfectly clear and eventually to carry on a fluent conversation of his own kind. If possessed of native sense and taste and aspiration, he sometimes came to speak a pure English which most of us might admire.

In all of these situations we find two elements standing out clearly. There is always a message to be communicated or received. The message is central in the learner's mind. He becomes totally regardless of the manner of communication, so long as he eventually succeeds in conveying his meaning or receiving the meaning which he wishes to get from others. The learning process is a series of random movements, hit or miss, in which the hits gradually come to exceed the misses and the latter finally disappear altogether. Sometime during the struggle of hits and misses, a feeling of confidence in language use comes and thenceforth learning is simply a matter of the final elimination of misses, that is to say, the acquisition of skill or facility. Such is the essence of language-arts learning everywhere.

PRIMARY READING.—The principle is applied in the primary school in teaching little children to read.¹

First of all, the children are exposed to an abundance of opportunities to read. The playhouse has its signboard. The new cart has its descriptive label. The sitting hen has the briefest of stories stenciled above her nest. And so the children become intimately familiarized with the fact that there is a symbolic language equivalent to their own spoken language. Presently a few of the children begin to announce that "they know what that says." A class is now formed. The teacher recalls some vivid experience which all have recently had, and she presently gets a sentence from one of the children suitable for her purpose. The sentence is printed on the board or on a stencil and the children become aware of the symbolism. In a few days, a succession of

¹ See Hardy, *Teachers' Manual* to "Child's Own Way Series."

these sentences appears, making a complete story. The children thus become familiar with the notion of a continuous discourse in print, and eager to get more of this printed talk. They may be seen at odd moments practicing with the material. For some time it is mere memory process. They know that somewhere there is a sentence which says thus and so, but their eyes are apt to be on any other as they repeat the sentence they have in mind. In a brief time, however, they follow down the chart or board with clear and correct recognition. In three months or less they have built up a use vocabulary in which words have been learned from reading thoughts, instead of sentence meanings being put together out of words identified elsewhere. Books are now placed in their hands, but, instead of being read in oral exercises, content reading is induced by asking questions about the meaning. If the children were asked the exact meaning of sentences in terms of the words used, the response would be meager. If they are asked to tell the story, the response is good and it becomes better with practice. The law of initial diffuse movements is in operation. There presently comes a time when the pupil becomes word conscious, but instead of being set up artificially in the beginning, the mental attitude comes naturally with the inclination to eliminate the last of the random movements. It seems to correspond to the period when the baby ceases to toddle and begins to walk. Unless circumstances prolong this period and thereby cause arrested development, the learner quickly passes it and reaches rapidly to the reading adaptation. When he seeks the book table and becomes absorbed in a book, it is pretty likely to be true that the reading adaptation has become established. This point can be verified, of course, by noting the eye movements which are characteristic of true reading.

As soon as the pupil has indubitably reached the reading adaptation, he is released from further class work, unless and until observation of his silent reading suggests some defect which needs correcting. He reads abundantly books of his own choosing. For the best results, a reading room or children's library is

provided, in charge of a teacher interested in children's reading and versed in the pedagogy of reading. Likewise, the teachers of geography, history, and other content subjects do not forget that an essential part of their own technique is the development of study ability and study ability is very largely proficiency in reading in special fields. Laboratory studies of children's subsequent development in reading ability show that with rare exceptions they continue to improve in comprehension, rate of reading, and proficiency in oral reading, in spite of the fact that they do not meet in a reading class for perhaps three or even four years prior to the end of the sixth grade.

This condensed description of method in primary reading will stand as the type for any sort of language-arts teaching whatsoever. It fits the foreign language in the high school or college, or in adult evening classes, the learning of vocal music, the piano, violin, or other form of musical expression; and it fits the acquisition of ability in English written expression.

CHAPTER XXIV

TEACHING IN FOREIGN LANGUAGE

IN this, as in all our chapters dealing with operative technique in specific fields, the point of primary and fundamental importance is a clear perception of the objective and an effective resolution on the part of the teacher to keep the objective in mind to the exclusion of cross purposes. The objective in this case is the reading or the speaking adaptation in the foreign tongue.

The method can be summarized as learning to read thought content by abundant experience in reading thought content from the beginning. It utilizes images set up by the use of voice, ear, eye, and hand, applied to the symbols in which the thought content is expressed, and trains them to work effectively together in conveying to the mind intelligible and reliable impressions gathered from the printed page or the spoken word.

I

FIRST STAGE.—The beginners' class enters the room without books, papers, or notes. It has no assignment and receives none, and such continues to be the case for many months. The teacher speaks in the foreign tongue some command such as "Open the window." He repeats it several times, with such gestures as may furnish the needed cue, until he gets some pupil to carry out the order. He continues to repeat until the class as a whole reacts satisfactorily. He then writes the command on the board and awaits the response in the same manner. Finally he has one pupil after another practice the commands, calling upon other pupils by name to carry them out, using both oral and written commands. Pupils are encouraged to "let themselves go," without self-consciousness because of their awkward vocalization of the strange

tongue. No rules for vocalization are given: the pupils simply imitate the teacher. This process continues until the class has acquired an initial sense of the use of the language as a vehicle of expression. Each day, the significant words and phrases are used again but varied in their combinations. For instance, "Open the window" becomes "Open the door." We use the term "initial sense" advisedly, for, while every pupil in the class may know perfectly well that as a matter of fact the language which he is beginning to learn is used for the expression of thought, such information is very different from the sense of reality which comes from actual use. Furthermore, the pupil is launched on his career of reading thought content directly instead of being allowed to become accustomed to the notion that language learning is a matter of learning words and forms in isolation and afterward putting them together in discourse which has a meaning.

In this early stage, the executed command is ideally the best device in any language, for it gives the best assurance that the pupil reacts to the sense of a full sentence instead of focalizing upon the meaning of separate words. It can be used in an ancient language like Latin as effectively as in a modern language like French, provided the teacher himself has a sufficient command of the ancient tongue. Such is not often the case. Further, the pupils are not likely to have occasion to read Latin which deals with current affairs expressed in modern thought content. Consequently, even if they should build up a Latin use sense, drawn from the physical classroom itself, let us say, it would be likely to be expressed in terms which would later find no place in their reading. Hence, the modification described below.

Instead of the command used in a modern language, sentences on the board are used. The board is kept perfectly free from all other work which might enter the fringe of consciousness and distract the attention with the effect of forming a blurred and vague visual image. The teacher secures perfect attention, saying "I am going to place on the board a Latin sentence which means 'the man is good.'" An instant of pause, holding the class,

and then the sentence is rapidly written in large and clearly formed letters and promptly erased. He then utters the sentence aloud two or three times, places it upon the board and erases it in the same manner as before. Next a pupil is called upon to read the sentence in Latin and then several pupils in succession; finally the class in unison. The initial sentence is then varied into "the boy is good," "the girl is good," "food is good," "the man was good," "the boy is strong," etc. In this way a use sense of words and forms is built up, but the forms are always sensed in their meaning in the sentence and not as isolated and abstract words. The teacher must use much greater precaution than is necessary in the modern language command step to prevent the pupils' building up an initial habit of looking for word meanings rather than sentence meanings. If the teacher pronounces the sentence slowly and artificially word by word instead of reading it aloud, this is just what will happen.

A variant on this procedure is to use flash cards on which the sentences as used are printed. Each card is then displayed for a fraction of a second, and as it disappears the class gives the English meaning. Exercises of this sort are used day after day until all pupils except the identified problem cases fall into the swing.

Whether the teaching is in a modern European language like French or German or an ancient language like Greek or Latin, this first-stage work is continued until the pupils react readily to thoughts which can be expressed in short sentences, even though the sentence itself be complex. They will have built up a considerable use capital of words, forms, and simple syntactical constructions.

II

SECOND STAGE.—When the possibilities of the first stage have been exhausted, as they should be after two or three weeks at the most, longer paragraphs are placed on the board. "Placed on the board" is used only in a general sense. The board will be used a great deal at first. Afterward, mimeographed material, or readers if suitable ones can be found, may be used instead of the

board. It is imperative, however, that the use of books or mimeographed material shall not lead to home or out-of-class assignments. The inevitable result with most pupils would be lesson-learning. If pupils exhibit a genuine interest and wish for such material, by all means they should be allowed to have it, but not in any case material which is to be used presently in the class. Such pupils may well be loaned the simplest of books in the foreign tongue. If they are really interested, these will best meet the need. If they are concerned only with lesson-learning, the books will not gratify the desire. In modern language, the paragraph thought content should be something which is absolutely familiar to the class. In Latin this is not so easy, for the reason mentioned above. However, the content in the latter should be at the least wholly intelligible, eliminating all reference to such strange terms as the names of Caesar's military diplomats. When the paragraph is on the board, the teacher reads it aloud, distinctly, but not as word-by-word pronunciation. Perhaps it is read several times, the class is called upon to read in unison, and finally several individuals are called upon. The teacher asks questions, first about the salient meanings and then questions touching remoter meanings. Of course it is an advantage to have questions so couched that they can be asked in the foreign tongue and similarly answered. Language development will in that way be more rapid, and the class will gain confidence. It is not, however, essential to the principles of the teaching involved as such. The matter of critical importance is that there shall be no transverbalizing the passage, or translation in the ordinary school use of that term.

The process is continued until the class has built up a use vocabulary of perhaps 200 common words and a use familiarity with the most common word forms and syntactical peculiarities. By actual count, some pupils in the third month of such exercise work as that of this stage and the preceding were found to be using in written papers (see below) from 250 to 275 different words and word forms. The principle to be observed here is that such

word meanings and form and syntax meanings should be developed slowly in proportion to the amount of content read. That is to say, the same meanings should appear over and over again in the paragraphs placed upon the board, and, while new meanings either of word or form or syntax should appear daily, they should not appear in such abundance as to induce the class to begin the memorization of such as isolated items. Similarly, the class should not be allowed to make lists of isolated meanings to be memorized. All the teacher's technique should be focused upon getting the class to read content and to pick up word and form meanings from the context instead of in isolation.

It is hard for the teacher who is habituated to the grammatical approach to believe that it is at all possible for pupils to understand the meaning of a form unless that form has been practiced in isolation until the pupil has a visual image of its place in the list of its kindred. It is still harder for him to believe that the pupil can manage a meaning expressed, let us say, in Latin indirect discourse, unless he has studied the principles of indirect discourse and then learned to make the application. Nevertheless, the pupil does so in practice, with on the whole less difficulty than his fellow-pupil at the same stage of advancement who has been trained in the grammatical principles involved and who has memorized all the paradigms which he has occasion to use. He does so because he is learning according to the principles which apply to effective learning in this type.

A few days prior to writing this chapter, the writer saw two Latin classes on the seventeenth day after the beginning of the first course. One section read a long board list of paragraphs with little difficulty. The other was handed a new volume of Latin stories and in a few minutes, less than ten, extracted the meaning from the first two pages. The process was in no sense different from what would be taking place about six weeks later, in the first-grade reading classes, with children who had begun to learn to read their mother-tongue on the same day on which the Latin sections had begun to read Latin.

Nevertheless, these Latin beginners had not completed the stage which we are now considering. They should go on building up their use meanings to the point at which, when they take the printed volume, they will read it with reasonable readiness, a readiness such that they will not be encouraged to begin the process of deciphering, such that the sense of new word meaning will tend to come from the context read. This prolongation of the second stage implies the preparation of a good deal of assimilative material in which the gradient from a meager use vocabulary to one which is considerable is slow and easy. There is little material ready-made for this purpose although a considerable amount has been published in the last few years, both in this country and in Europe. The teacher can best prepare such material himself, and that takes time. Nevertheless, the accumulation of material year by year will in a very few years give an abundant quantity. The defect in most beginner's readers or first books is that the gradient referred to is much too steep. New words and forms appear so rapidly that the learner does not assimilate in the manner required by language-arts principles. He becomes swamped in the mass of new isolated learnings and promptly falls back on the process of memorizing, deciphering and transverbalizing.

III

WRITING.—As soon as a sufficient use vocabulary has been built up, the pupils should be encouraged to begin writing, not exercises, but continuous stories of their own. Volunteers at first are induced to "plunge into" discourse and write as well as they can. They are told not to mind making mistakes. Of course they will make them: that is the way we learn a language. The teacher who can induce the class to forget their schoolroom shyness and formalism will be surprised to see how soon pupils will be writing really acceptable French and Latin, with fewer blunders on the whole than those who come to this stage after months, and years even, of formalized exercise work, and with infinitely more zest and reality in their writing. There is on file in the laboratory

an original Latin play written by a second-year girl who began this way. A tactful teacher who has the educational point of view and who can forget her prepossessions in favor of bringing all pupils into some sort of relationship to standard performance as contrasted with learning will soon have most of the class writing, each in his own way. There will be great differences in the excellence of the writing as performance, but as long as the pupil is writing and endeavoring to express himself, the quality of his performance as such is of minor importance. He is practicing in the use of the foreign tongue for the expression of thought, and that is the basis from which he builds up his language adaptations. Furthermore, he is not primarily learning to write but to read. Self-expression in the foreign tongue is an important part of the language-arts complex which manifests itself chiefly in reading.

The following passage is the direct quotation of a paper in Latin submitted in a beginner's class on November 3. The course began on October 3. The paper was therefore turned in on the 24th day.

MARCUS

Marcus filius Publii est. Publius agricola est, sed Marcus in bello pugnat. Marcus arma multa habet. Arma scuta, gladii, galea sunt. Marcus in castris Romanis manet. Interdum aestate in oppido habitat. In tecto pulchro manet. Soror Marci Julia est. Marcus saepe Cornelian et Publium non videt. Cornelia mater Marci est. In casa in agra in insula parvo habitant. Ex fenestra tectis in oppido silvam vident. Noctu stellam claram et lunam pulchram vident. Vesperi Marcus puellis et puerorum fabulas narrat, set puerorum fabulas non amant.

Marcus amicum habet qui nauta est. Nauta solus stat. Nauta Marcum exspectat, sed Marcus domi est. Marcus cum Helena est. Nautam non videt, et nauta miser et defessus est. Nauta ad tectum ambulat et Helenam videt. Helenam laudat, sed Marcus Helenam amat. Nauta Juliam, sororam Marci, amat.

The quotation is the paper just as it came to the teacher. It contains mistakes, but no more than would be likely to appear in

a daily exercise which would ordinarily be set several months later. The mistakes are not important in view of the fact that the pupil is having an experience of using new words, forms, and syntactical principles to which she has become accustomed through use. She uses a genitive for the subject of a clause, but then in most sentences she uses the nominative. She uses the same genitive as an indirect object, but in the same construction she uses another word in its proper case. The pupil had never learned a word or form in isolation. She had never memorized a vocabulary or a paradigm. If she had ever heard of the accusative case, she had picked it up elsewhere than in the class. She had not been told that the direct object is in the accusative, but had sensed the use from her board work. The discourse is not Ciceronian but it is Helen's. She blunders in Latin, but she still blunders in English. Of a collection of 37 first-year papers, representing 19 different pupils, dating from November to March of the first year, the paper quoted is one of the best, but it is by no means the best, nor does it represent the climax of expressional capacity among these pupils. After eleven days more practice, another pupil passed in a paper of more than twice the length and revealing much more complexity of expression. The paper last named is flawless except for one misuse of a case form. The shortest paper has 47 words and 9 errors, and this is about the poorest in the lot.

The reader will thus be able to see more concretely what is meant by early writing and to realize that the pupil can in fact be led into the stride which means writing and not mere exercise work. If it can be done with Latin, it can the more readily, effectively, and profitably be done with a modern language. And so it is.

IV

THIRD STAGE.—When the class has accumulated a stock of word, form, and syntax uses sufficient for rapid book reading, the second stage fades into the stage of book reading. If the use meanings which form the basis of training in the second stage have been systematically related to those found in the books

which it is intended to use first, of course the gradient from the second stage into the third will be the more easily negotiated.

So far as is possible, the books selected for the third stage should be real content and not merely school exercise books. Such are comparatively easy to find in German, they are less frequent in French and Spanish, and rare indeed in Latin. It may perhaps be suggested in passing that here is a rich field of service for American teachers. There is needed a list of titles, particularly in French, Spanish, and Latin, reaching to many times the number which are now available. These books will have to be made. One of the most effective types of such books has been found to be stories which, though not translations, are based upon stories with which children are familiar in their mother-tongue. An example is Miss Perley's *Que fait Gaston*.

The book in the hands of the class, the procedure is essentially the same as that followed in the second stage. A selection of considerable length, a page or more, is read silently by the class. The pupils are told first to read rapidly, not pausing for unfamiliar words or obscure passages, and they are assured that even on the first reading the larger meanings will begin to appear, though perhaps vaguely and uncertainly. They next read silently again, not sentence by sentence, but perhaps paragraph by paragraph, or it may be by groups of sentences. The meaning begins to clear up and in this way the pupil learns how to search for the sense of the longer passages. Such is supervised study in the language arts. As different pupils reach what appears to them to be satisfactory apprehension of the meaning of the selection read, the teacher is notified; and, when most of the class have finished, the teacher quizzes on the meaning. By the end of this period, the troublesome words and other usages are pretty likely to be brought to the teacher's attention, and these are then taken up and explained.

"Explained" is used advisedly: the English equivalent of a meaning is not sufficient. In a very true sense, there are no such equivalents, for any word takes on its meaning from the context.

Even in the mother-tongue a given word has materially different meanings in different contexts. For instance, the word "man" may mean simply a male as distinguished from a female. It may mean an adult as distinguished from a boy. It may mean a person who has the attributes of virility which we like to associate with mature manhood in contrast with others who have them not. And it may have a variety of other meanings.

In this way, every class period is a teaching test and an index to the teacher as to the reteaching required.

Some passages encountered will contain constructions which will clear up later. These the teacher passes by. More often the teacher will realize the need of reteaching of specific uses and then a brief period is taken for the purpose, using the principles of the second stage. Some individuals will appear as problem cases, needing individual corrective work, and these we shall discuss later.

As in the second stage, there is need of testing periodically for more exact evidence than the day-to-day test will give. And so the test is framed essentially on the principles which are discussed below and interpreted in the same manner. The difference between tests in the two stages is one of degree rather than one of kind; the present test is focused on a more highly developed discourse. The reteaching, however, is of the same kind. If the class as a whole is vague in its capacity to interpret the printed page, the indications are *prima facie* that the gradient is becoming too steep. We turn back to easier reading. If there is little or no failure, the reading is pushed on rapidly to a region in which the gradient is more steep. The problem cases are noted and studied. It is perhaps unnecessary to warn the reader that the initial presumption of poor test results is that there has been neglect of control technique, that the teacher has allowed various members of the class to drop out of the learning situation. Hence, the systematic and careful teacher endeavors to scrutinize this aspect of his work first in a severe self-examination, before considering his language-arts problem as such.

Throughout the reading stage, the free writing is kept up. The several pupils if skilfully handled will develop writing power as practice goes on and as the character of the reading discourse develops.

V

PRONUNCIATION AND PHONETICS.—The reader has doubtless in mind the query, what about pronunciation, vocalization, phonetics? The point requires some discussion.

It is very easy here to mistake the primary objective, and in that way to waste time and to work at cross purposes. It is perhaps unfortunate that many people judge a child's ability to read his mother-tongue by his efficiency or fluency in oral reading. A considerable degree of skill in oral reading is entirely compatible with very poor proficiency in real reading for content. Similarly, many people think that a good command of foreign language accent is synonymous with command of the language itself. It does not follow.

Good oral command may very well be an objective in itself, apart from and in addition to the reading objective. If so, then the skilfully devised methods of the phonetician are not only helpful but indispensable. In that case, not only is it desirable that the pupil shall learn the use of a visual phonetic alphabet, but it is necessary that he shall be drilled in vocal exercises until his vocal apparatus as a whole becomes adjusted to the new uses. Such practice is no part of the language-arts procedure, but an instance of pure practice teaching of the first sub-type. It may be desirable, and often is, but the teacher must not confuse this objective with the reading objective.

On the other hand, vocalization seems to be intimately a contribution to the acquisition of language-use sense. Reading probably always involves that subconscious utterance which is sometimes called inner speech and which seems to be bound up fundamentally with the thought process itself. Competent grammarians say that many forms which enter into the grammatical structure have a phonetic significance. Hence, all through the

three stages which we have studied, practice in oral reading, provided it is not practice in mere word pronunciation, is a great help, and perhaps an essential in acquiring that language sense which ultimately leads to the reading adaptation. In so far as the use of phonetic devices is an aid in achieving this purpose of oral reading, they should be used, but they should not be allowed in this present connection to become an end in themselves.

In the first stage in modern language, there is a good deal of natural practice in vocalization. High-school pupils, at the average age of fifteen, will not prove so adaptable as younger children at the age of nine or younger. Their vocal habits have become more firmly established. But they are nevertheless capable of learning effectively in the presence of a teacher who has good vocal command himself and is willing to exert such influence as he has.

In the second and third stages, there should be a great deal of reading aloud. It is not essential that all the content read shall first be vocalized. That would be wasteful of time, and it would quickly degenerate into routine. During the second stage, perhaps one of the board paragraphs will be read aloud daily. The teacher reads fluently and with natural expression, but not too rapidly. If the selection is Latin, he does not attempt to read with the clipping utterance of a modern language, but rather bears in mind that Latin is rich in vowel sounds, sonorous, and when well read has been said to suggest the tramp of the Roman legions. He then reads again, and the class follows him in unison, the teacher's voice dominating. The purpose is not primarily to train pupils to read aloud but to give them practice in vocalizing a series of language meanings. As the class gains confidence, first one pupil and then another is called upon to read orally. The reading pupil is not interrupted to call attention to false quantity or false phrasing. Rather when he has finished, the teacher reads over the defective passage and the pupil follows him. In the end, the proficient pupils may be called upon to lead the class in unison practice. In the third stage, the class will read aloud less fre-

quently but the pupils are advised that reading aloud at home will help them greatly. Perhaps one day in five on the average is set apart for prolonged practice.

Throughout the stage of silent reading, in class, from books, the emphasis is upon much reading rather than upon intensive reading. The teaching problem is to furnish the basis for so much practice with content which has a meaning and appeal of its own that the principle of initial diffuse movements may have full swing, under motivation which originates in interest in the content read. The foregoing statement of principle should of course not be taken as advice to encourage or accept negligent, or half-hearted, or effortless reading. An essential part of the teacher's task is always to be on the hunt for suitable reading material.

VI

FREE READING.—Silent reading in class is, however, far from being the whole story. In addition, the class should be exposed to an abundance of free voluntary reading out of class. From the beginning of the course, in French for instance, long before pupils have made much progress in class reading, there should be placed on a suitable table in the classroom a stock of French reading material, not school exercise books but books and periodicals made to be read. Such material should be really exposed to the class and the class to it. This does not happen when books are placed in rows in a bookcase, behind closed doors. Assuming the material to have been well selected and effectively displayed, the teacher will find that first one and then another pupil is lingering about the book table and trying to read French. As the stage of silent reading from books comes on, pupils will often become enthusiastic in practicing their developing power to read, and the results will, of course, effectively reinforce the learning which takes place in class. As a matter of fact, children so treated do read in abundance, often an incredible amount. Now the formalist can quickly kill an incipient intellectual interest of this sort by becoming unduly critical as to whether the pupils are "reading

thoroughly." It is not essential that they should read thoroughly. Thoroughness applies to the actual mastery of reading ability and not to drudgery with exercise work. If they are reading voluntarily what they desire to read, that is quite sufficient. The class silent reading under control will care for that purpose of thorough reading which is wise thoroughness. Free reading which is really free gives us the best possible evidence of approaching mastery of the true learning product, because it enables us to observe the behavior of the pupil in an unsupervised and unconstrained situation. The pupil who is really reading will disclose to the teacher in manifold ways the reality and extent of his reading. He will wish to talk about his reading. He will bring difficulties to the teacher. He will talk over the book he would like to read next.

In Latin, the problem of free reading is of course more difficult, for the reason that the material is much less abundant. Nevertheless, the industrious teacher will find a great deal. At least, copies of all the books which contain the material to be read later may be left on the table together with copies of the classics.

VII

THE READING ADAPTATION.—The stage of silent reading, with its associated writing and collateral free reading, is obviously the foundation of the first course, the course which leads to the reading adaptation. The time required may be six months, a year, two years. Time-to-be-spent is not the primary consideration, and it is certainly not a valid method of evaluating progress.

After perhaps six months, the teacher begins to observe the free-reading habits of pupils more closely, with the purpose of watching for signs of approach of the reading adaptation. Presently, he notes that a certain pupil becomes absorbed in books containing non-technical discourse of ordinary difficulty, the standard perhaps of a popular story written for the average reader in a modern language. The pupil shows little of the puzzled brow which is associated with deciphering, he seeks not for the

lexicon nor for annotations. His features show much the same play of interest which is exhibited when he reads a similar English selection. We observe him as he turns the pages. He does so at intervals corresponding rather closely to what would be the case if he were reading his mother-tongue. As he turns the page, his eyes seek the upper lines and he reads on. He does not pause and gaze about the room as though he were summoning resolution for a fresh start. If we profile his application for twenty minutes, the result is a straight line with occasional momentary distractions. After several observations of this sort we feel confident that the pupil is reading. We may assure ourselves by observing the eye movements on one or more occasions. If they show the characteristic reading fixations, our first impressions are confirmed. We are further assured when we note that all the recent reading tests have shown few if any mistakes. The pupil has finished the course and is excused from further attendance in class, but he is admonished to come to the teacher periodically to report what free reading he is doing and otherwise to confirm the teacher's judgment. If he proposes to go on with the language and a section in a grammar course is open, he is allowed to enter that. If no section is open, he waits for one. Other pupils will require a longer period of development before the objective is attained. A month later, two or three perhaps have mastered. Later still others; and perhaps some will run over into the second, or even the third year. And then there are the non-learners, subjects for special study.

VIII

TESTING.—Unlike the situation found in the assimilation period of the science type, every day's teaching is also a day of testing. The teacher can become very sensitive in his *rappor*t with the actual progress of a language class. Reteaching becomes a process of turning back to the reading of material at a lower point on the gradient of difficulty until the class catches its stride again. Or it may mean lingering at the point now reached and supplying an abundance of new material in which the word and form mean-

ings that have been used are kept but no new meanings are added for a few days. The critical points in the reteaching are two.

First, the teacher should avoid isolating a new meaning whether of word, form, or syntax and studying it by itself out of context. On the other hand, it may often be well, in the case of a meaning which is difficult to catch, to fall back on first-stage principles and develop the usage from sentences at the board.

Second, it is imperative that the teacher shall "follow the mind" of the class and of every individual in it, shall learn to sense without formal testing whether or not the class is learning.

Nevertheless, it is essential to careful teaching that there shall at intervals be set a formal test for the purpose of more deliberately taking stock of progress. In this manner.

A selection of considerable length is chosen, long enough to give opportunity for the inclusion of most of the vocabulary and form and syntax meanings used to date, but not of progressive order of difficulty. A series of twenty to thirty questions is then carefully framed to cover the thought content. The pupils write answers to the questions, the papers are collected and studied, not for the purpose of scoring but for the purpose of extracting such light on the progress of the learning as they may contain. The charted results of such a test may perhaps look something like the exhibit in Table XI. Right responses are indicated by —; wrong ones by X.

Let us see what we can make out of the exhibit, bearing in mind that we are interested in its disclosures as to the progress of the class, and of the individual pupils, toward the reading adaptation and not in the relative values of the scores made by the different pupils.

First of all, we note that F and G have reacted correctly to every item they have tried. We know them for painstaking but rather slow workers. The evidence of learning in their cases is as good as that in the cases of D and O who have tried every item of the test and have reacted to all correctly. The suggestion that F and G might have failed in subsequent items if they had tried

them is no better than the suggestion that D and O might have failed on items 25-30 inclusive if such had been included. The evidence may disclose that F and G have wasteful learning methods, but it does not disclose that they do not learn.

We note that there is a wholly disproportionate number of failures on item 10. Probably the question was a "misfire." If so, a little reconsideration will be likely to disclose the difficulty.

TABLE XI

Pupils	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Total Rights
A.....	-	-	-	-	-	x	-	-	-	x	-	-	x	-	x	-	-	-	x	x	x	-	-	x	x	16
B.....	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
C.....	-	-	-	-	-	-	-	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
D.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
E.....	-	x	-	-	x	-	-	-	x	x	-	-	x	-	x	-	x	-	x	-	-	-	-	x	-	16
F.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
G.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
H.....	-	-	-	x	x	x	x	x	x	x	-	-	x	x	x	x	x	-	-	-	-	-	-	-	-	4
I.....	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
J.....	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
K.....	-	-	-	-	-	-	x	-	x	x	-	-	x	x	-	x	-	-	-	-	-	-	-	-	-	19
L.....	-	-	-	-	x	-	x	-	x	x	-	-	x	-	x	-	-	-	-	-	-	-	-	-	-	19
M.....	-	-	-	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
N.....	-	-	-	-	-	-	-	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
O.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Totals.....	15	14	15	14	11	13	11	14	11	4	14	13	10	14	10	14	13	14	12	13	12	13	11	11	11	307

If we decide that the question was in fact of that character, then four more pupils are added to our 100-per-cent list. If, on the other hand, we can find no good reason why pupils should not have reacted correctly to the questions, we must conclude that it points out a region in which reteaching is called for.

Questions 5-7, 9, 12, 13, 15, 17, 19-25 indicate regions for reteaching, not, be it observed, with reference to themselves, but with respect to the word, form, or syntax meanings with which they are associated.

Now, turning again to the pupils, A, E, K, and L evidently need some special corrective teaching. C and M may or may not. Individual conference will disclose.

Pupil H is a problem case for study. It is early in the course yet and we may be able to find and correct the obstacles which are hindering him or we may find he has some deeply rooted impediment which will make it undesirable for him to continue in the study of language.

We now have definite guidance for continuing our teaching intelligently.¹

IX

THE PROBLEM CASE.—The slow learner or the non-learner in a foreign language presents many of the same learning maladies which we have found in our study of the other types of teaching. In some respects, he presents difficulties which are peculiarly language difficulties. Some obstinate cases, for which remedial work is indicated in the sciences, are hardly worth either the pupil's or the school's time and energy in the languages. After all, the learning of a foreign language is the learning of an art which may contribute to the fundamental adjustments which we call education but it is not itself one of those adjustments. The pupil may use French, for instance, as the key to whole storehouses of assimilative material in the arts and sciences and social inter-

¹ REPORT ON SPECIAL TESTING.—During the school year 1926-27 an extended program of testing and observation of the learning process in French reading was carried out, using for the purpose pupils ranging in maturity from Grade V to the college freshman year. The reading of three members of the teaching staff as a control group was also studied. The results are summarized in brief here, partly for the purpose of exhibiting the reality of the reading adaptation and partly to suggest a theory of testing which is aimed at identification of a learning product as contrasted with scoring performance.

EYE-MOVEMENTS.—We have frequently noted the use of photographs of the perceptual movements of the eye in reading as affording one of the most convincing symptomatic evidences of the character of reading done. In general, mature reading, that is, reading at adaptation level, shows relatively few eye fixations, few regressive movements, few exploratory movements, and relatively short time-intervals per line read. In order to make the matter somewhat clearer, a few lines of French showing the eye-movement picture as photographed are here exhibited,

course, to which his mother-tongue does not give him access, and that is valuable, but it is not determinative of the possibility of an educated existence in the world.

Our first concern is the slow language learner who is organically such and not slow merely because of lack of application or some other correctable defect in his learning process. Such pupils

first for a good reader and then a similar set for a pupil who has not yet learned to read.

Bonaparte ¹traverse ²la montagne, ³monte ⁴sur ⁵un ⁶cheval,

conduit ¹par ²un ³guide ⁴du pays. ⁵Par ⁷intervalles, ⁶inter- ⁸ ⁹

rogeant ¹le ²conducteur ³qui l'accompagne, ⁴il ⁵le fais-

ait ²conter ³sa vie, ⁴ses ⁵plaisirs, ⁶ses ⁷peines. ⁸Le ⁹con-

Bonaparte ²traverse ^{1 3}la montagne, ^{4 5 6}monte ⁷sur ¹⁰un ¹¹cheval,

conduit ¹par ²un ³guide ⁴du pays. ⁶Par ^{7 8}intervalles, ^{10 9}inter- ^{11 12} ¹³

rogeant ¹le ^{3 7 5 2}conducteur ^{4 6 8 9}qui ¹¹l'accompagne, ¹⁰il ¹²le ^{13 14 15}fais-

ait ¹conter ²sa ⁵vie, ⁷ses ⁶plaisirs, ⁹ses ^{8 10}peines. ^{12 11}Le ¹³con- ^{3 14 4}

The vertical lines show the points at which the eye in moving across the page rested. The numerals attached to the lines show the order of fixations. Thus, in the fourth line of the reading of the second pupil, the eye fell near the first word and next on the line was the second fixation; but the third and fourth fixations fell near the end of the line in conformity with the random movements of the learner. The instrument also records the duration of each fixation in 25ths of a second. We thus have very precise and entirely objective means of counting and measuring the characteristics noted above. Can we find some critical values which mark off those who are reading at adaptation level? Apparently we can, although the full body of data, for lack of space, is not exhibited here.

In the first place, we have teachers concerning whose mature ability there can be no question, no more than there is a question concerning other teachers' ma-

make steady progress and ultimately achieve the learning product of the course as truly and as well as do the rapid learners. Their needs are ordinarily sufficiently well met by grouping the class in fast and slow sections. The problem of the rapid learner is much like that of his slow contemporary and is met in the same way. In order to provide for both types and the various grada-

turity in the reading of English. The following table shows the results for the teachers.

TABLE A
EYE MOVEMENTS FOR FRENCH TEACHERS

		Range
Mean fixations per line	6.5	5.2- 7.7
Mean number of movements of slight confusion on passage of 14-17 lines .	3.3	1.0- 5.0
Mean number of movements of bad confusion	0.0	0.0- 1.0
Mean duration per line in 25ths seconds	45.0	39.0-54.0

Now if we turn to our collection of 51 plates (not shown here) for pupils and college students and correlate the several sets of symptoms, we find the break between mature and immature readers comes at between 7 and 8 fixations per line. At least there is a critical value at that point at or below which we can feel confident that the adaptation has taken place, above which we cannot feel confident, and if the fixations are above 9 we can feel sure that adaptation has not taken place. That is to say, if we compare number of fixations per line with number of movements of bad confusion on each plate, we find either no instances at all of the latter or else only one, up to the plates which show 9 fixations per line. Beyond that point, the number of movements of bad confusion increases rather markedly up to 33 for the plate which shows 20 fixations per line. In the similar comparison for movements of slight confusion, the break comes at 7 fixations per line. Again, when we compare the number of lines which show no marked defects whatever with number of fixations the break comes at 7.

Scrutinizing the 51 plates referred to above, we identify 13 pupils and students who had evidently attained the adaptation and were reading as truly as the teachers were reading, and these were widely distributed as follows:

Grade level	Number of pupils	Length of time in French classes
VI	1	2½ years
VII	1	Unknown
IX	2	Less than 1 year
X	5	1½ years
XI	2	2½ years
XII	1	3½ years
College Freshmen	1	Less than 1 year

How long these particular pupils had been reading at adaptation level we have no means of knowing. They were reading as truly as the teachers were reading. Does that mean that they were reading *as well* as the teachers were reading? In point of facility, the mean duration per line for the teachers is 45 and for the pupils 49, with a range of 39-54 for the teachers and 26-68 for the pupils. But suppose

tions between, it is ideally desirable to have as many sections in the reading course as the exigencies of registration and administration will permit. Under these conditions, a new section of beginners is started every few months, let us say at least every semester. The pupil who then becomes identified as a rapid

the selections had been more difficult reading, would not the teachers have made a much better comparative showing? Indeed, would not the pupils, probably, have failed to show the critical fixation values? Undoubtedly. But in that case, we should have been deriving values for something which is decidedly more than reading. The selection used is expressed in non-technical, uninvolved discourse. The superior facility which the teachers would have shown on a more complex ideational content, expressed in more complex discourse, would have been a function of higher intellectual organization and a more extended apperceptive mass. See also p. 284, *supra*.

UTILITY.—Now, an elaborate and highly technical piece of instrumentation, such as we used in the investigations thus described, would be entirely impracticable in the classroom. Nevertheless, one of the characteristics of reading at the adaptation level is found to be the rate at which the page is read, and that can fairly well be observed directly.

At first glance, there would appear to be only a rough relationship between number of fixations and duration per line read, and indeed the relationship is not precise. Closer scrutiny reveals the fact that 60 can perhaps be made a useful dividing point.

Only one of the cases which fall within the 8- fixations limit shows a duration per line of more than 60. Six of the 38 cases which fall outside the 8- fixations show a duration of 60 or less. If we use duration as an index, 1/13 of the pupils who we feel sure are readers would be excluded; and 6/38 of the non-readers would be admitted. Thus we are uncertain to the extent of 8 per cent in one direction and 16 per cent in the other.

A duration of 60 is 2.4 seconds to the line, or 25 standard lines to the minute. Hence, if we watch pupils reading silently from ordinary 12 mo. books of non-technical material, observe that they show the characteristic eye-movements and other facial signs, and note that they turn pages regularly at intervals of about a minute and a quarter, they are probably reading. There will probably be an uncertain border zone of about 4 or 5 pupils in a class of 30.

If we rest upon observation of reading alone, we have no factual material which discloses whether the pupil is actually absorbing thought content or merely going through the motions? I think that the evidence is fairly clear that reading is reading and that, if a pupil shows the outward behavior symptoms of reading, he is probably reading with all that implies. The particular pupils who were used in the investigation were tested for their comprehension of the material which they read. In ordinary classroom practice, we ought to secure corroborative evidence from the type of comprehension test described above. See p. 500.

learner is placed in the fast section. In turn, he may in exceptional cases find his way into a section which is still farther on the road toward the course objective.

It is perhaps unnecessary to remind the reader that Course I, the reading course, is not conceived as a course which necessarily conforms to the traditions of the school calendar and is thereby limited to the academic year. Some pupils may reach the reading adaptation in less than a year and some may require two years or more, even under the best of systematic teaching. The difference between June and September is not other than the difference between April and May, except that the long summer vacation may introduce a period of more or less loss of power gained.

As in the case of supervised study in the science type, sluggish learning or non-learning may be traceable to poor sustained application. The pupil is not natively slow, but he will not apply himself. He takes only a languid and perfunctory part in the essential class exercises. His mind is elsewhere. It is, of course, important that the teacher shall identify and correct his habit before accepting the pupil as a slow learner. Otherwise, he will presently prove to be simply the tail of the slowest section as he is now the trailer in a relatively fast section. It is a volitional problem which requires vigorous personnel work by the teacher and perhaps by the personnel staff of the school.

The problem case may be a decipherer in his mother-tongue. Conference with teachers of the content subjects will probably reveal that he is slow in the assimilation period and possibly a non-learner. His language-arts inhibitions will have carried over from English and he is not likely to learn a foreign language until they have been removed. Corrective or remedial treatment in the content subject, where such treatment is essential, is likely to go far toward the removal of his inhibitions in foreign language. In most such instances, the case will probably be best handled by dropping the pupil out of foreign language until the defect has been remedied, allowing him to enter a section which begins later, perhaps the next year.

Sensory difficulties with either vision or hearing are of course peculiarly inhibitory of progress in a language section. Of the same order is the case of the stammerer. Vision can usually be remedied. The remedy of hearing defects is more difficult. Stammering can now be corrected in many if not most instances. If the hearing is so defective as to amount to a serious impediment, the pupil would best be advised to forego learning to read a foreign language unless his need is imperative. He might still acquire the reading ability in a course conducted on special principles. The stammerer would similarly best be advised to drop the language course, at least until his defect has been remedied.

Nutritional disorder and low level of general health of course present the same obstacles to language learning as they do throughout the process of education, and the same principle applies to the emotional cases discussed in chapter xxx. It may be noted, however, that obstinate language cases are probably at times traceable to specific quasi-emotional inhibitions traceable perhaps to the pupil's reluctance to transfer his thought processes to a new medium.

There remains that class of cases which are usually consigned to the limbo of "no language ability." Except in rare instances of peculiar language maladies which are likely to reveal themselves earlier in learning to read the mother-tongue if they appear at all, and if indeed they have any real existence, and subnormal children, it is perhaps doubtful that there is such a thing as organic language incapacity. However that may be, it is certain that many cases usually classed as organic incapacity are in fact either correctable or remedial on some of the counts enumerated above or on others not listed, provided the pupil's educational needs make it worth while to make the attempt.

X

GRAMMAR.—Quite as important as the teaching itself is the sequence of courses provided.

On the principles to which we adhere, the first course has for

its single objective ability to read. As we have seen, objectives which require attention to isolate elements of discourse, if included in the course the objective of which is the use of discourse in its fundamental purpose, will tend to set up the language-arts inhibition and either slow up the learning process or divert it into a process of acquiring deciphering or transverbalizing ability. For most pupils, the reading course is all that is essential or even desirable. The pupil now has an implement which he can use in assimilating the content of books and other material printed in language other than his own, and in securing a more immediate contact with the life and thought habits of alien races.

On the other hand, it may be and frequently is desirable to utilize the foreign tongue for the purpose of reading at the level of advanced culture the literature of another people or for the purposes of exact scholarship. In either case a process of training is called for, the objective of which is putting the student in possession of the refinements of meaning and an understanding of the principles of the discourse structure. Thus does he become capable of an independent and critical attitude toward the exact meaning of what he reads and what he writes. A distinct course in grammar is called for conducted on science-type principles. (See chapter xiii.) Similarly, a companion course is indicated, the purpose of which is essentially a study of the exact meanings of words as they appear in reading material selected for the purposes of the course.

It should be noted, however, that both these courses, and especially the grammar course, have very practical and definite objectives. They are not offered for any vague developmental or disciplinary purposes. Grammar is learned in order that the pupil may acquire certain understandings of sentence structure which enable him to grasp more exactly the meaning of what he reads, not for the purpose of giving him exercises in mental gymnastics. Thus the units in grammar can be more intelligently selected and focused upon the objective intended. If a given unit

meets an essential need for the understanding of discourse, it is used. Otherwise it is excluded as non-essential.

That there is any legitimate place for such a course in the secondary school may well be doubted, but with that issue we have no present concern.

XI

THE LITERATURES.—Just as the course in grammar is necessarily distinct in method and in objective from the reading course, so the courses in literature proper are distinct from either. The objective in the reading course is a language-arts objective, in the grammar course it is of the science type, in literature it is an objective in appreciation. There is no pedagogical objection to the use of pieces of literature for silent reading purposes in the third stage of the reading course, provided the content has its own immediate appeal. Such, however, is not often the case. It is notably far from true when the attempt is made to use the *Commentaries* of Julius Caesar and the *Orations* of Cicero as assimilative material in developing a reading ability in Latin. Again pieces of literature may be used as basal material in studying the refinements of word and form and syntax meanings, but in that case the purpose is linguistic and not literary.

In general, literature courses in modern languages should be conducted in accordance with the principles set forth for the conduct of English literature in the appreciation type, and we shall add no further comment.

Courses in Latin literature, or Greek if it is still found in the school, present problems of their own, largely because there is not available a sufficient body of reading material for a low gradient leading through the reading course and into discourse of the complexity which the classical writers use. Hence, in the reading of Cicero, for instance, there is a language-arts problem as well as one in appreciation. For this reason, the following suggestions are contributed. The *Catilinarian Orations* are used as our point of departure.

Now the *Orations* against Catiline deal with an episode in

Roman life which has had its counterpart again and again in the later history of the world and even in our own times. The speeches themselves are the denunciations of a master of invective directed against a man who is conceived to be a scheming politician engaged in capitalizing the discontent of the times for his own aggrandizement. To read them effectively is to catch the meaning of the conspiracy itself, to sense the point and effect of the speeches, perhaps to form some opinion of the value of Cicero's apology for the execution, and withal to experience the tale as it was told two thousand years ago by one of the world's greatest orators. Similarly, in reading the *Archias* we are reading a memorable eulogy of literature and of the man of letters. In reading the *Manilian Law* we are dealing with a forensic, in intent much like a speech in our own Senate uttered in support of a pending measure. To read the speeches with these things in mind is very different from using the Latin text as an exercise in transverbalization and syntax.

In conducting the reading of the Catiline, our first task is to see that an adequate picture of the times and of the setting of the oration is drawn. This may involve one or more presentations at the hands of the teacher, and it certainly will involve the reading and discussion around the table of several books which deal graphically with the period and with the events. In the end, the class approaches the reading of the Latin itself with an intelligent appreciation of what it is all about and hopefully with some curiosity as to how Cicero made out and what he had to say.

Taking the first oration, the teacher makes a clear presentation of the argument as a whole and then perhaps of the section which it is proposed first to read. This first section is read aloud by the teacher, and then teacher and pupils read in unison. It is difficult to get too much of this oral reading, provided it is well done and is not allowed to become a matter of routine.

The class is then asked to study the passage and to make an outline of the points which the orator is making, all in the classroom. As in the silent reading, the class is advised to read, not

translate, several times if need be, until the meaning begins to clear up.

Finally, using the principles of the silent reading stage in the reading course, the meaning is brought out by specific questions centered upon the meaning. When this has been done and not till then, questions may be raised touching obscurities of meaning, but these are made plain by explanation and not by translation. In similar fashion, the whole oration is covered, and the other orations.

Bearing in mind the principle that this is or should be an appreciation course primarily and a language-arts course secondarily, its value in the secondary curriculum should be judged on appreciation principles. If there is probably something of appreciation value in Cicero for the pupils who are to pursue the course, then there may be some sound educational reason for offering the course. If the pupil is reading Cicero only because successfully passing the course will give him the necessary credits for the next step in institutional routine, then it is not likely that any educational product will appear.

Much the same situation is found with respect to the reading of Virgil or other poets. If the pupil has actually acquired the reading adaptation, he will still experience much the same kind of difficulty which he encounters in reading some of the more involved poetry of his mother tongue, different in degree perhaps but not different in kind. The same procedure is followed as in the case of the Ciceronian *Orations*, adapted of course, to the peculiar requirements of poetical expression. Reading aloud, which is important in the orations, becomes trebly important in poetry, especially in the form of metrical rendering of the content. Sense of value, which is vaguely felt as one perceives the meaning of the content, becomes acute and lasting as the rhythm and cadence make themselves felt.

CHAPTER XXV

TEACHING IN WRITTEN EXPRESSION

IT WOULD be a great help in understanding the pedagogical nature of written expression if all teachers and administrative officers could keep in mind always the obvious fact that a person's narrative, descriptive or expository writing is at bottom a concrete, objective record of his intellectual processes. A good story-teller is first of all an individual who is capable of visualizing and living over again the events of his story in their essential order and meaning. There is no good descriptive writing apart from keen and discriminating observation. There can be no clear expository writing save as the writer thoroughly understands his subject matter. That is the reason, as I think, why a brief written paper in science-type subjects is the most valid of final tests. The remark "I know but I cannot tell," so often heard in the schoolroom, is self-deception.

Of the three forms to which reference has just been made, exposition is by far the most important in education, since it is not only the form which is most frequently used but it is further the form which is the vehicle of learning in the attainment of valid attitudes of intelligence, that is to say, in the intellectualization of the individual's world. Narration and description are forms which are used chiefly by professional writers.

The development of respectable command of the English language as a vehicle of written expression is then inevitably a responsibility of the school as a whole. The pupil secures his most valuable experience in writing in courses which belong to the science and practical-arts types of learning and teaching, and experience secured elsewhere is inevitably more or less artificial. Furthermore, intellectual discipline, the volitional side of intelligence, is met with in vigorous insistence on clear and accurate

writing. If universities commend as teachers of science-type subjects people who are semi-illiterate, or at the best slovenly in their writing, on the ground that chemistry or biology or economics is not English, then the best of English departments in the secondary school will fail to generate good writing in their graduates, for the pupil's patterns and constraints will mostly be in the hands of incompetents.

Nevertheless, there is a technology in written expression and for that the English department must primarily be responsible, both as a matter of teaching and as a matter of supervision of other departments in their concern for the writing of pupils. I refer here especially to *composition*, the art of putting sentences, paragraphs, and the production as a whole together in a discourse structure which is known to be the most effective and which in itself contributes to intellectual clarity and self-control; and to *diction* or the principles which govern the use of words. Further, there are independent courses, not of the language-arts type, the sole reason for which is found in their relation to written expression. These are of course notably grammar and spelling.

I

THE LEARNING PRODUCTS.—The learning product is language-arts in type and it conforms closely to the nature of the product in foreign language which we have discussed at length. That is to say, it is fundamentally an ability adaptation in terms of which the individual expresses himself in running discourse without focal consciousness of its isolated elements.

PRIMARY ADAPTATION.—Study of pupils in the primary school, and of problem cases as far up as college freshmen, makes it fairly evident that there is a primary adaptation here, primary in the sense of being fundamental in personality structure as well as in the sense of being normally attained in the primary school. It may perhaps be characterized as an awareness that handwriting is necessarily related to the expression of meaning and an in-

variable tendency for written expression to be balked whenever it does not express a meaning which is clear to the writer.

Learning in school is necessarily a more or less artificial experience and children are perhaps as likely to take up the lesson-learning attitude from the beginning as to learn directly and normally unless they are watched and guided. Hence both reading and written expression are likely to be sensed by the pupil merely as incomprehensible school exercises set by his elders and therefore to be pursued with more or less diligence, but not necessarily with intelligible purpose.

Like most experienced teachers, I have repeatedly encountered children of high-school age who would read orally well enough, but prove to be entirely incapable of disclosing any meaning attached to what they had read and incapable of carrying out printed directions. Naturally such people make a very low score indeed on most intelligence tests and therefore are adjudged to be mentally defective. The competent primary teacher now takes care that learners sense the meaning and purport of reading as the first step in learning to read at all. Tests of the Burgess type of course identify the perverts very early, but, unless the teacher is aware of the nature of the difficulty, she is apt to fall back on some organic explanation. "Just isn't in the pupil."

Similarly with written expression. The pupil is given exercises in handwriting devoid of any expressional significance. Later on, he spends years on language papers with a performance standard always in mind. He may and frequently does slip through with no real sense of what it is all about, that is to say, with failure of the primary adaptation. We have treated these cases at college freshman level when the student's writing in spots was gibberish. I have found them repeatedly among graduate students. The similar situation with some stenographers has been noted. Such individuals write intelligently enough whatever has meaning to them—although they are prone to be more or less illiterate—but they are perfectly willing to write what does not have any meaning at all. The normally-developed person balks at the meaning-

less sentences and chides himself by saying, "It does not make sense."

When pupils embark on the process of learning by study, they ought to be checked for the presence of the primary adaptation. If it is missing in older pupils, remedial procedure is rather obvious and not at all difficult.

THE SECONDARY ADAPTATION.—The secondary adaptation may be defined as a sense of correct, coherent, clear expression, and a willingness to employ such discourse in customary written work. It is a mark of intellectual maturity and it implies a great variety of learnings both within the field of the study of discourse itself and in different forms of subject matter concerning which there may be occasion for expression. It implies a sense of coherency in the sentence in that the compelling logic of the laws of agreement are customarily felt and customarily observed. It implies a sense of the use of punctuation to express meaning as contrasted with a body of arbitrary rules. It implies a sense of meaning so that the writer does not customarily write what he does not mean. It does not imply perfection in performance; even an accomplished writer will occasionally commit blunders in any of the elements of good writing, including spelling. It does not necessarily imply stylistic accomplishments. An individual may claim to have attained maturity in his written expression and still indulge in such elementary faults as split infinitives and dangling verbals. It does not imply the specialized attainments of the professional writer.

The secondary adaptation implies a great variety of learnings, but it is not a collection of such learnings. Like all personality adaptations, it is unitary in character, to be identified by its characteristics and not to be measured as a body of content. Very frequently indeed the background which is capable of supporting the adaptation is present and yet the adaptation does not emerge until a strong teacher or director compels emergence by what are tantamount to disciplinary measures. Once definitely

established and manifested as such, it necessarily constitutes one of the best pieces of evidence of the end of the secondary period and completion of general education.

II

DEVELOPMENTAL PHENOMENA.—The principle which reveals written expression as the concrete picture of intellectual processes has developmental implications which are readily to be observed in the unfolding of the pupil's discourse as we find it in the schoolroom.

For a time in the pre-school, immediately after the infant learns to talk, his discourse characteristically lacks verbs. We rarely find that in school, and certainly not in the secondary school, save in an occasional instance of arrested development or "baby talk," but, if the student will examine the free writing of children up to the age of nine or ten, he will find few instances in which they use compound or complex sentences or phrases of any description. Even the troublesome repetition of "and" is more likely to amount to the ill-judged use of an introductory particle than to the use of the word as a true connective. As they mature in ideational content and intellectual organization, and as each learns to manage his own discourse, the more involved sentences appear.

Now, as the pupil passes over into early adolescence, there seems to be a strong tendency for his written expression to fall off, judged purely as performance, and it is likely not to recover until toward the end of the high school period. This puzzling phenomenon has, apparently, a very simple explanation. It is well known that early adolescence is likely to be a period of new impulses, new experiences and rapidly expanding ideational content. The situation is exaggerated by the prevailing tendency in our discontinuous school system to launch the pupil into a new kind of school at about that time. The result seems to be a period of more or less intellectual confusion and incipient personality disorganization, such that written expression gets beyond

the capacity of the pupil to manage his own discourse. This experience is not necessarily unhealthy, but it is uneconomical and in the cases of emotionally unstable children it is very likely dangerous. Whatever is tending to bring about a continuous school system is tending to eliminate or at least ameliorate this period of confusion.

TEACHING IMPLICATIONS.—There is thus suggested the principle of the moving goal. So long as there is insistence that the individual pupil always do his best, and instruction in the right use of the discourse forms with which he is tending to experiment, normal and natural development can be left to work out its destiny. For instance, when the pupil begins to use personal and relative pronouns, he will be pretty likely to ignore the agreement between pronoun and antecedent. Thus a question of meaning is introduced and the simple instruction is "Is not this (the correct form) what you mean." Thus, there is built up in all writing a *sense* of right expression as contrasted with grammatical comprehension of right use, and thus the pupil learns how to manage the discourse which he himself is using.

The principle stands squarely in the way of any such device as grade norms, since the latter can be satisfied only through conformity to purely artificial standards which can match the evolving discourse needs of but few pupils in a class or section, be they never so critically worked out. It does not stand in the way of courses in spelling and usage as practically economical methods of instruction, or of courses in grammar which, as we have seen, have a different educational purpose.

It follows that usage instruction, which is dealt with below, and instruction in spelling and grammar, which are dealt with elsewhere, are valueless as means of contributing to the development which eventually leads to the secondary adaptation in written expression unless correct spelling and usage and grammatical principles are schooled into the pupil's discourse as it is and not as it might be. Schools tend to depart from the requirements of normal growth and set up wasteful and formalistic teaching. Spell-

ing is made an end in itself and the pupil is drilled on the images of words which will not become a part of his use vocabulary for years, if indeed ever. Similarly, punctuation and grammatical-usage courses are set up and the pupil is taught a memoriter performance long before his developing discourse needs find places for the usages taught. Worse than all, he is "promoted" from grade to grade in terms of his lesson performance on spelling lessons, language lessons, and the like, quite without regard to functional use in natural discourse situations.

LESSON-LEARNING.—The most effective enemy of progress toward the true learning product is our old acquaintance, the lesson objective and the lesson-learning attitude. The adaptation is not reached until the pupil has gone through the transformation in terms of which he customarily writes clearly and correctly whenever he has occasion to write. The routine of teaching and administration which evaluates lesson performance in written expression in class and neglects expression elsewhere rapidly builds up an entirely false attitude in the pupil toward his learning and sets up a formal performance objective in the place of a learning objective. In general, he feels clearly that when he has satisfied the English teacher in a particular course or even in a particular month in that course, it is an injustice to be required to use what he has learned in his writing in other classes or even in the same class at a later period. His whole attitude toward learning is a purely commercial one in which he understands the teacher's part to be the setting of tasks and his part to be the acceptable performance of those tasks, in return for which he is entitled to certain credits.

The first step in preventing the development of the lesson-learning attitude or in breaking down the attitude if it has become established, is to require the pupil to use what he has learned whenever he writes. The first step, though essential, is not enough. Faithfully carried out, purely as a matter of routine, it soon becomes formal, and the pupil tends simply to broaden his conception of lesson-performance. Whereas before he had

only the English teacher to satisfy, now he recognizes that he has others as well to satisfy.

The perversity which can be exhibited in opposition to learning is frequently seen in a lazy pupil's attitude, in that he will make no genuine effort, comfortable in the assurance that he can try again, thus postponing the evil day. The only possible recourse is for the teacher to convince the pupil that in the latter's own language he cannot "get away with it." How these pupils are to be dealt with in a school which has to fear even mild reprimands as provocative of unpopularity and unfavorable newspaper comment has not, so far as I know, been revealed.

The second step is then to convince him, by direct attack on the attitude itself, that he should desire to write well, not because the school requires it, but because it is a part of his education. It is comparatively easy to teach pupils to spell and punctuate correctly, to grasp and apply correct principles of grammar, to apprehend and apply correct principles of usage, but it is often exceedingly difficult to develop in them what may perhaps be called a discourse conscience. Nevertheless, this is the critical step on the road which leads to the learning product sought. The pupil who fails persistently to respond becomes a remedial case of the volitional type.

III

CLASSROOM TECHNIQUE.—From the standpoint of teaching technique there are then two major considerations to be kept in mind, the development of the power of self-expression and the related power of correct expression.

The power of self-expression, as we have seen, is chiefly a matter of meanings to express and of severe training in such expression. Hence, we find the foundation of English written expression not in English classes, but in the courses which the school offers in subjects which belong to the science type, the appreciation type, the practical arts type, and especially the first. These are the fields in which the pupil is expanding his ideational content and organizing it into coherent systems of thought which are ca-

pable of being expressed in coherent discourse. We have already discussed the principles at work in our treatment of the science type, and in the present chapter. We shall barely summarize them here. In the presentation test, in the organization, in the oral and written recitation, in various reports on special voluntary projects, the pupil has an abundance of assimilative discourse practice. He enters this field in the early grades as soon as the primary adaptation has become established, and he does not leave it as long as he remains a student, perhaps long beyond the stage of maturity. The relation between his practice in writing and his learning in the subjects which he is studying is a mutual one. He finds in these subjects almost his only genuine opportunities for motivated expression of meanings in abundance, and his practice in writing out his meanings is by all odds his best opportunity for the clarification of thought and the establishment of the learnings which are appropriate in the teaching types listed.

CORRECT USAGE.—We turn then to the other major element of the discourse complex, the matter of correct writing, that is, usage. The amount of space in this discussion which we devote to instruction in usage is disproportionate if we consider the relative values or the time element. The proportion of teaching time per pupil instructed in usage is perhaps one-twentieth, or even much less, when we compare it with the pupil's writing experience in the content subjects. Its relative value in developing power is perhaps still less.

The form in which the educated man of today expresses himself is the product of a long evolutionary process. We often use the term "conventional use," but strictly speaking there are few conventions in language. What we call correct usage is what it is, not because scholars have agreed to use certain forms, but because the latter are best adapted to the accurate expression of meaning. The educated writer for instance is distressed by the incorrect use of the partitive in the expression "best of any," not because he has learned from a manual that it is wrong but be-

cause he senses that it expresses an impossible thought. It may very well, however, be true that a manual first called his attention to the incongruity of the expression. Furthermore, language is still evolving because the meanings which have to be expressed are evolving. The present stage in which good discourse finds itself is a sort of end result in the racial application of the law of initial diffuse movements. If we could sufficiently motivate the growing child and furnish him with a sufficient breadth and intensity of intellectual experience, it is altogether probable that he would eventually write correctly with no usage or language instruction whatever. Unhappily, that is an ideal which is, at present at least, scarcely realizable in the school. What may be called the strategy of technique is, however, to keep as close as possible to the line of evolution, with a maximum of intellectual contacts and motivation and a minimum of usage training.

A WORKING LIST.—Our first need is a working list of correct language usages in terms of errors commonly made. A good many analyses of incorrect writing have been made and these have been compared with the discourse of educated, non-professional writers. The result is a considerable number of brief manuals of usage. It is well for the teacher to have several of these on his desk, and it goes without saying that he should be thoroughly familiar with their content. It is convenient to make a memorandum of the usages for which we must be on the lookout in the form of numbered brief notes, after this fashion:

1. Capital first word
 2. Period at end
 3. Question mark in interrogative
 -
 10. Words in correct use as to meaning
 -
 12. Run-on sentence
 -
 18. Restrictive and non-restrictive clauses
- And so on.

Now we begin to get some writing even in the primary school. As the secondary period comes on, we receive more and more. Bearing in mind that the pupil's natural writing rather than his English exercise work is both the point of departure and the final test, the papers which pupils write in other than usage periods are examined for errors in usage.

We shall find in the first place that the most common type of error is in spelling. This matter is set aside for another kind of teaching.

Next, we shall perhaps find that some papers, aside from spelling, are impeccable so far as they go. The sentences are simple and perhaps there is no occasion for paragraphing. The pupils to whom the papers belong write as well as their intellectual content makes necessary or possible. The capitalization is correct and the punctuation is good. They do not set off relative clauses with commas, but they use no relative clauses. Such limited use of grammatical principles as they make is correct use. For the most part they come from homes in which there is a good deal of reading done and a customary use of good English. These pupils are subjected to no instruction whatever. The day when they will need to use forms which they do not now use is not anticipated. When that day comes, we shall see what needs it brings. Meantime, they continue to get much practice in writing in natural situations, that is, in situations in which they have a meaning to express. Most of these situations will, as we have seen, appear in connection with other school work.

Most of the papers, however, show incorrect usage to a greater or less extent. Not many different kinds of mistakes, because their discourse is not yet sufficiently developed to make many such possible. Nevertheless, we do find a considerable number. Some of them are characteristic of the class as a whole, but most of them are revealed by some individuals and not by others.

CLASSROOM TECHNIQUE.—The mistakes which appear in many of the papers give us our basis for class instruction, and for one or more periods we devote ourselves to each in turn. The

teaching here is a succession of very thin science-type units. The five-step procedure is not at all needed; the content of the unit is not extensive enough for that. Instruction is mainly presentation, assimilative exercises, teaching test, and reteaching. The concrete case here cited will serve as an illustration.

"I see most of you use such forms as this": (reads from a paper). "I see it in James's paper": (reads) "and in Nellie's" (reads). "Now the correct way is this": (Writes on the board several of the sentences in correct form.) Explains at length until she feels satisfied that the pupils have caught the notion. A series of missing word sentences, or unpunctuated or uncapitalized sentences, is then given to make sure that the instruction has registered. If the teaching has not registered, the teacher tries to find the difficulty and reteaches until it does register. A large number of practice sentences is then given for assimilative experience, and these exercise papers are turned back until all have learned to use the right form in the right place. Finally, the original papers (perhaps history stories in this case) are returned for correction and rewriting wholly or in part.

At the end of this experience the teacher announces that the pupils will write the appropriate rule, which she dictates, in notebooks, which are kept for the purpose, with one or more illustrative sentences. The pupils are then reminded that they now know that principle of usage and will be expected to write correctly, so far as it is concerned, in the future. They are reminded that they have their notebooks for help whenever they are in doubt. And they subsequently are all held responsible for correct use by having any paper whatsoever turned back with the simple admonition, "There is a mistake in language which you know better than to make; find it and correct neatly before you hand in the paper." Thus the pupil builds up a usage conscience and likewise a handy keeper of his conscience in the form of his own manual of usage.

Much the same procedure is followed with the individuals whose errors are peculiarly their own, but instruction is individual rather than of the group. A concrete notion of the class

period devoted to usage, or language if the customary term is preferred, may perhaps be gained from the description which follows.

A CLASS AT WORK.—In the first place, the class does not necessarily meet for this purpose every day, nor does the whole class meet. The teacher has been reading papers written in the content subjects or elsewhere and at length has accumulated a stock of errors which calls for a campaign of instruction. Perhaps all children in the room need some teaching, perhaps a few need none at present and busy themselves about other tasks, possibly teaching is called for only with a few corrective problem cases. Let us assume that all or nearly all require some specific instruction.

A class period or, it may be, several periods are devoted to group teaching on common errors. Then for several days the teacher meets the class for individual teaching. This, be it observed, will usually be simple corrective teaching requiring on the whole less time on each usage item to be dealt with than is the case with the more formidable errors which call for group teaching. For instance, here is a sixth-grade boy who turns in a paper which is excellent in content, in arrangement, and, except in one particular, in usage. He has used the apostrophe for possessives in all his plural nouns. Evidently he did not fully catch the idea when that principle was taught. Simply a minute or two at the teacher's desk will set him right. Eventually, it may be after a week or more, all individual pupil cases are cleared up and the usage class is suspended for some days.

Now devoting a class period to individual teaching in this manner implies good foremanship on the part of the teacher. Let us visit first a very poor teacher and then a very good one.

The first room chances to be one in which most of the children are in the sixth year of school life. It might have been the eighth, or the fourth, or the twelfth, for that matter. The teacher is at her desk and down one aisle is a long queue of children, each waiting his turn. These pupils are twisting and turning and occasionally

indulging in incipient "rough-housing." A few of the pupils who are at their desks are intently reading, some of them books from the shelves and one or two of them are absorbed in cheap juveniles. The majority of the class are lolling over their desks and in the adjoining aisles, apparently playing but actually tortured by that peculiar boredom which makes the schoolroom a daily nightmare to so many children. Occasionally, the teacher looks up and remarks "I must have better order." No visible result except a series of curious stares at the general region of the teacher's desk. "Tom, you go to work or I will send you to the principal's office." Tom stares vacantly at his arithmetic for a few minutes.

Of course this is a sheer waste of time and indeed much worse.

The next room has children of about the same age as the first. At the beginning, there is a moment of confusion, as the children select their occupations for the period. In less than two minutes, everybody is absorbed in his individual task and a pupil has passed to the desk at a nod from the teacher. Both this pupil and the teacher are intent upon the pupil's paper for five minutes and then another pupil takes the place vacated by the first. Two minutes. In a thirty-minute period eight pupils pass through this individual instruction and the teacher makes not a single comment addressed to the class. We note the occupations of the class. Several are at work on their papers or their language notebooks. Two have books from the library which they are using in the preparation of special papers which they expect to submit later, one in geography and the other in history. They brought the books to class with them. Three are hard at work on arithmetic. Six others, with guide sheets before them, are reading either geographical or historical material. One is working at an individual spelling list. Three are reading useful books in elementary science and one a volume of *Useful Knowledge* taken from the library.

Now in this room there is no waste of time. The teacher will need less than one week to finish this particular block of usage

items. We make some inquiries among the pupils. "Why are you studying arithmetic?" "I am up in language but arithmetic comes hard to me." "What are you doing?" "Writing a paper on what the English thought about our Revolution." "Why do you do that?" "Well, I like to, I guess." To another: "How do you know what to do when the period begins?" "Why, this is what we always do." The time not utilized for usage instruction by pupils who do not at present need it is devoted to the most natural thing in the world, working on what they do need or on that in which they have acquired a present intellectual interest. And so all these children are moving on toward self-dependence.

Meantime, the follow-up is faithfully observed, in the manner which we have already described, in the papers submitted in subjects other than English.

ORAL READING.—A useful, perhaps essential, device in the teaching of correct usage is the oral reading of written papers. There are two good reasons. In the first place, the vocalization of what has been written is a very important element in building up usage sense. A pupil will frequently criticize an incorrect use by stating that "it does not sound right." Of course he is quite right. Much of the structure of correct discourse has been built up in response to the requirements of vocalization, either audible speech or that inner speech which seems to accompany all thought, and its expression in written form. In the second place, as the pupil's vocabulary expands, it will be found that he uses some words in perfectly correct meanings but in strange and bizarre pronunciations, simply because as a matter of fact he has never heard the words pronounced. Effective vocalization of spelling lists will undoubtedly do much to build up a phonetic sense, but it will not do enough. Hence a good deal of reading aloud.

Now there is a wide difference between perfunctory exercises in oral reading, which used to be so common, and the real reading in a genuine audience situation of something which the pupil has produced. Hence, in the lower grades of the secondary school and well up into the junior-high-school region, it is desirable to

seize upon all appropriate situations for the reading of papers in geography, history, science, community life and other content subjects. The practice may well be continued, less emphatically perhaps, throughout the period of general education. Special reports on topics in which individual pupils have become interested, good written recitation papers, especially those which use a relatively rich vocabulary, accounts of interesting vacation trips and the like, suggest themselves. Of course long experience in the oral recitation contributes to this need in the same sense in which the oral reading of the written paper contributes.

PUNCTUATION.—A special application of the above is found in punctuation. The essential purpose of punctuation is to carry over into written discourse the meanings which are naturally expressed in the pauses of oral speech. Thus, punctuation is itself a language art. A crude response to this principle was the precept for "expression" in oral reading which old-time schools sometimes taught. "Count one at a comma; two at a semi-colon; three at a colon; and four at a period." I have before me the confession of a junior-college girl who explains that the impossibilities of punctuation faded when she discovered that "punctuation must be in the mind before it is on paper." No doubt rules for punctuation must be set up and the pupil must learn how to use them, but, unless he comes to sense the application of the rules as applications of the need of expressing vocalized values, his punctuation will be puzzling and uncertain ever. It would perhaps be fortunate indeed if teachers and editors could learn the same principle. People who write would not then have their meanings completely distorted by the application of set rules.

USE OF DICTIONARY.—The question is frequently raised in classes of teachers, "What about teaching the use of the dictionary?"

This is merely one of the major items in usage teaching. Simple enough if brought in when the pupil's expanding vocabularies have developed a real need of it and not different from other items in that respect.

At about fifth- or sixth-grade level, a considerable number of pupils will be fairly likely to have found a good many words, especially geographical terms, which they are inclined to use and which they will be inclined to pronounce almost anyhow. It is a distinctly favorable symptom if the pupil does so pronounce, because it tends to show that he is free from the language-arts inhibition. The need of some teaching in the use of the dictionary is called for. Accordingly, the teacher presents the unit, one which in content by the way is much more like a true science-type unit. The essence of the instruction is, "This is the way we find out how to pronounce an unfamiliar word."

A familiar word is placed on the board with the conventional diacritical workings. The teacher pronounces, pointing to each syllable and marked quantity and accenting as she does so. Several words are treated in this way, the class following in unison until the teacher feels that the idea has registered. Perfect control technique required. She now follows the same procedure with some unfamiliar words until again she is satisfied that the art has been caught. Finally, she places on the board a list of many words, properly marked, and tests the class individually to make sure that all have learned. The group of slow learners is then segregated for reteaching. Thus the presentation. The class is now given a list of many words, taken from their geographies or other subjects, for assimilative practice and told to find the pronunciations. They are then gathered for class exercise, not unlike a daily recitation, and practice upon the words which they looked up. Now this class exercise is in itself a test but only incidentally so. Its major purpose is that of assimilative practice. The process is kept up until the teacher is satisfied in the cases of one after another that all have mastered. Henceforth, the new-found ability must be used and considerable corrective teaching is likely to be found to be necessary. That is, some pupils will still need to be sent to their glossary or to the dictionary to look up words which they mispronounce.

It should be noted most carefully that the learning product

here is the use of diacritical markings as a help in discovering the pronunciation of unfamiliar words. It is not the teaching of word pronunciation itself. Hence the exercise of common sense and good judgment is called for. If the routinist makes a point of requiring the children to look up the pronunciation of literally every new word, he or she will quickly build up a set of study inhibitions. If successful, simply a crop of little pedants will be generated. If on the other hand, the teacher pronounces for the pupil every time he raises his hand for help, the all too familiar result will be the production of a new lot of grown-up babies. The teacher must sense when to pronounce a new word for the class, if the study situation is in full swing, and when to tell the pupil to look up a new word if mere indolence inclines the latter to rely upon the teacher.

RELEASE.—This process of instruction in correct usage goes on from month to month and year to year, never allowing specific instruction on an item of usage to anticipate the child's discourse use of the item. The pupil is never taught a principle of punctuation, for instance, until his papers show that he needs it, no matter how strongly the teacher, with the prestige of organized knowledge rather than the pupil in mind, feels that "they ought to know it." It will be noted that as early as the sixth year of school life some pupils come less and less often into the class group or to the teacher's desk for instruction. They are finding their own way and keeping their usage parallel with their developing discourse. By the end of the eighth grade, in a school which has faithfully and intelligently followed the appropriate teaching procedure, there should be few pupils left who still are obliged to come frequently to the teacher for instruction. The pupils who have thus been automatically released are at the first plateau of the typical learning curve on their climb to the level of mature adaptation. They still occasionally blunder, their style is appropriate to the still immature character of their intellectual development, but it is improving as their cultural breadth expands and becomes organized. In brief, they write correctly in

the main but their discourse is that of the schoolboy or school-girl. See that they have a handy manual and good dictionary of their own, that they use both, that they do not allow themselves to lapse into bad habits, that they have the abundant writing suited to the thorough learning in science type, appreciation, and practical arts subjects and then leave them alone. Progress in the high school will depend much more upon the fidelity of teachers in the subjects last named than upon anything the English department can do.

RESPONSIBILITY.—In the volitional evolution of young people, there are few elements which enter more definitely into the conduct structure than willingness to do as well as one knows in English usage. In maturity it is easy and natural to do so. We have noted the specific lesson-learning proclivity which is prone to appear. Scarcely anywhere else is credit for work done so likely to be treated as the end of a chapter in the school career. Hence, the effective school allows no credit for usage courses, but rather assures its pupils that they will not be graduated until they have demonstrated over a prolonged period that they not only can but will use their mother tongue in a reputable fashion, that they will not be certified through the school's diploma until they have convinced the administration that they can be trusted.

IV

TESTING.—As is the case in all language-arts subjects, teaching itself is usually testing. The issue from day to day is, Is the teaching and the learning which is done in the composition period appearing as a true learning product in the writing which the pupil does when he is not writing English exercises as such? If it is so appearing, then progress is satisfactory. Otherwise specific reteaching, including reiterated emphasis on the principle that whatever the pupil is taught is to be learned for the sake of use, is called for.

Nevertheless, here as elsewhere it is important from time to time to inventory the progress of the class and make a study in

the concrete for the sake of the veracious picture it affords of the true situation. For this purpose, a series of papers, one or more for each pupil, written in a wholly unsupervised situation, that is, papers which are in no sense English exercises, is chosen. With the standard list of usages in hand, the teacher checks, first, the number of opportunities for correct use of the principles which each paper shows; and, second, the number of instances in which the pupil reacts correctly. The percentage of correct reactions is then computed. The resulting exhibit may look something like the tabulation here presented in Table XII.

TABLE XII

Pupil	No. of Opportunities	Correct Reactions	Per Cent Correct
A.....	60	52	87
B.....	50	50	100
C.....	20	20	100
D.....	80	32	40
E.....	58	58	100
F.....	46	45	98
G.....	66	22	33
H.....	72	72	100
I.....	30	12	40
J.....	18	18	100
K.....	64	64	100
L.....	16	1	6

Our problem is now to study the results in order to see what they can tell us.

We note first of course B, C, E, H, J, and K. These pupils differ widely in the number of opportunities but they all react correctly. H and K use a relatively complex discourse and they manage it correctly. C and J still use an extremely simple form, but what they use they too manage correctly. So far as progress in correct writing is concerned, the latter need give us no concern, but we shall do well to consider their general intellectual growth. Are they reading widely and interestedly? Are they lesson-learners in science and history? Perhaps we shall find little cause for comment in any of these fields. It may be that they

will always use a form of discourse which is so simple as to give little opportunity for incorrect usage, but then some of our best state papers have shown that characteristic. It may be, so far as we can learn, that their reading and general intellectual growth is normal. If so, let them alone: their discourse will expand sufficiently to care for their needs and, as far as this examination shows, they can be trusted to learn to manage correctly whatever they write. On the other hand, it may be that they are uninterested and sluggish in all their content subjects. If so, the region of corrective measures is in that field.

H is a careful and studious boy who comes from a cultured home, is accustomed to language which is finished and accomplished in its management of thought, and withal is himself rapidly growing intellectually. Let him alone. B, E, and K show much the same characteristics as H, but in the cases of B and E to a markedly less degree.

D, G, and I are apparently lesson-learners. It is well, however, to settle this question before proceeding farther. Accordingly the pupils are tested on the principles which they misuse, in sentences set up for that purpose. Thus we discover whether or not in fact they need reteaching. One or more of them may need some reteaching and that is accordingly done. In general, however, they do well under teaching but do not make the application. We thus identify the aspect in which they are problem cases and know just where to attack.

Of the three D is known to be an omnivorous reader and is interested in his content subjects. His discourse is developing more rapidly than he is willing to learn how to manage it. In his case, the emphasis will be placed at first on training him in intensive reading in the assimilation period of the science type and in the organization step.

L is a non-learner. His discourse is very simple and he reacts correctly only to a single opportunity. What he writes is less than half a page. He makes only two sentences and the division be-

tween them is incorrectly identified. He is now in his fifth school year, came to us two years ago from another school, and has been more or less a problem in all subjects. Verdict: a remedial case, probably of the experiential type, requiring remedial treatment.

F is developing at a fair rate. His single error is an oversight which any mature writer might make. For all practical purposes, so far as usage training is concerned, he belongs in the same class with B, C, E, H, J, and K.

A is developing well on the expressional side but he is careless. He is not a lesson-learner, but he has not fully made the learning adaptation in terms of which he does as well as he knows. We thus separate this defect, make him conscious of it, and proceed on the same principles as those followed for developing sustained application and reading skills. (See chapter ix and chapter xv.)

Now it is very easy to completely misapprehend the bearing of the percentages which appear in the last column of the tabulation. The reader accustomed to the practice of scoring will tend to seize upon them and exclaim "Here is something definite; we can now draw a dividing line." On the contrary, the percentages are in themselves nothing definite. They do not enable us to draw dividing lines and thus separate the linguistic sheep from the goats. They are simply means of making differences stand out somewhat more clearly and of attracting our attention more vividly to the several pupils. It is only when they thus induce us to study the individual pupils that they become valuable. On the next inventory, H may show the F characteristics but that will not at all alter our judgment of his essential learning condition. If he should later show the relation between opportunities and correct usage which A shows, and if we then conclude that he is getting careless, it will be occasion for action. But 87 per cent as compared with 98 per cent or 100 per cent is in itself no ground for action. On the other hand, 40 per cent and 33 per cent lead us to suspect lesson-learning, but lesson-learning is not demonstrated until we raise the issue itself in the test we have described. In brief, we cannot set up a standard score and say, "Above this we

are satisfied; below this we are not satisfied." When we do so, we adopt all the unrealities of the passing grade.

PUPILS FROM OTHER SCHOOLS.—Thus far, we have dealt with a situation in which it is assumed that systematic development in the use of English as a tool of expression will begin as soon as the pupil has established the reading and handwriting adaptations and that he will continue in the same school system until the mature adaptation has become established. High schools and junior colleges, however, usually receive pupils from schools which are not parts of the same system to which they belong. Such pupils are therefore pretty likely to be at all stages of development, from that reached by H in our tabulation down to that reached by L.

It is evident folly to conclude in the abstract, "These pupils need a course or courses in composition," and then to conclude that about three high-school courses of a school year each should serve the purpose. The educational situation is ignored, the learning products are disregarded, the needs of individual pupils are overlooked. All are dumped together into a mechanical routine. Our best schools no longer follow that practice. They pre-test the entering class and at least form sections in accordance with the disclosures of the pre-test. A great deal, however, hangs on the nature of the pre-test. The issue is not, Does the pupil know certain principles, but rather, Does he manage correctly the discourse which he writes. Hence, the appropriate form of pre-test is in the nature of the inventory which we have exhibited. Assuming that such an inventory were made and that the disclosures were in proportion such as we have found in the exhibit on page 530, more than 50 per cent of the class would be assigned to no usage class in the high school. They would be faithfully watched, however, in all content subjects, would receive much writing practice therein, and some of them might later be assigned temporarily to a corrective section in English writing. This would especially be the case in the not unlikely contingency that a pupil of the C or J type should begin to expand and organ-

ize his ideational content into a more complex form. In that case he might begin to take on the D characteristics and would probably need some specific teaching. Nevertheless, at high-school level such a pupil should be required to use his manual and help himself to the maximum of his capacity. Teaching a pupil what he can learn for himself always results in volitional involution rather than evolution, in increasing dependency rather than self-dependence.

The foregoing discussion of testing rests on the principle of the moving goal, on the assumption that the pupil is maturing and has not yet matured. So far as guidance and reteaching are concerned, we have in mind an objective control of the maturing process but not immediately the ultimate learning product. In our study of teaching, we must then look for the principles under which we shall estimate evidence of maturity.

V

EVIDENCE OF MATURITY.—When has a pupil, perhaps in the senior high school or junior college, learned to write, not as the professional person writes, but as the educated man or woman writes or ought to write; that is, when has he reached maturity?

There is no single objective test analogous to what would be used in medicine or in engineering nor in the nature of things is there ever likely to be. Bearing in mind, however, the principles which have been developed in the present chapter and in the two preceding chapters, we can perhaps see how to look for and evaluate evidence.

I have four manuscripts submitted by adult persons dealing with a subject which requires somewhat severe expository treatment. I am a qualified reader of the content which is set forth.

The first of these papers has the subject matter well organized; that is to say, the topic is well developed from point to point, so that I can follow the argument. It is grammatically correct: my mind does not hesitate, as I search for the sequence of pronoun

and its antecedent for instance. The vocabulary is adequate: the meaning is nowhere obscure because the writer has not the words with which to express himself. The spelling is correct throughout. The punctuation is sufficient for the clear expression of the meaning intended: I am not obliged to stop in order to see just where a certain clause belongs. The writer has undoubtedly attained the adaptation which is characteristic of the educated man.

The second paper deals with the subject in a more precise fashion than the first. Consequently, the argument is more searching and critical. Otherwise, it is much like the first save that it has some faults in spelling. I note, however, that in every case the words misspelled are correctly used later. This person too has arrived, but he is somewhat careless and requires editorial oversight and discipline. Even Stevenson is said to have been careless in spelling.

The third paper is well organized as a composition, and it is therefore easy to follow the argument. It is trenchant and forceful in statement. There is no instance of a sentence which is grammatically bad, although there are several elementary infelicities in style. The writer has developed punctuation sense. But the paper is full of cheap colloquialisms and misuse of words and there are several careless misspellings. The student has not arrived. How nearly has he reached maturity? An interview discloses the facts. "Is this word in reputable use?" "What word ought you to use?" "Why do you spell 'procedure' in two different ways?" "Is 'data' singular or plural?" The answers are all satisfactory. The student is at that stage at which he needs merely a vigorous disciplinary admonition to push him over. It is administered. In reply to his apologia, "I was always poor in English," he is told that he can no longer cultivate that luxury.

The fourth paper is the most extended of the lot. It is incoherent; that is to say, the several logical steps in the argument are confused and there are introduced many pages of irrelevant mat-

ter. The vocabulary is inadequate; the writer falls back on such expressions as "that thing" and upon colloquial and slang expressions which do not convey his meaning. He uses sentences which say what he does not mean and others in which clauses are mutually contradictory. There are several glaring faults in grammar and spelling on every page. This writer clearly has not matured. The reader cannot make out the meaning unless he is willing to approach the task as would be the case if he were attempting to decipher an ancient inscription in a foreign language. The student's mind is replete with content, he is intellectually interested in the studies which he is pursuing, but he has never experienced the severe training in organizing his intellectual content which thoughtful writing alone gives. He is not even willing to hold himself to the task of doing as well as he knows. He is a graduate of an institution of college grade, but in his high-school and college career he has simply won credit for passing-grade, lesson-performance in English classes. The papers which he has submitted in other courses have been graded for content in the courses pursued and the instructors have dismissed his written-expression failings as no part of their concern.

Are the first two papers of equal value? Clearly not. The first is superior in some respects and the second in others. If we were judging one hundred papers instead of three, we should find no two of equal merit as a matter of performance, but we should be obliged to set up several series of graded excellencies. This paper is impeccable in composition and diction but colorless. Another exhibits distinct literary talent in happy phrasing and use of words. Another still is masterful in its logical clarity and convincing argument. And so on. We might go farther and examine some standard works of acknowledged literary merit and we should find much the same story. The truth of the matter is, the question is irrelevant. The important question is not relative rank, but evidence of the adaptation.

Should not these several excellencies be accorded "recogni-

tion?" Assuredly, provided we are not thus deceived as to the main point at issue. Whatever accurate devices may be adopted as a means of describing a pupil's attainments are steps in the direction of full pedagogical analysis, but such descriptions cannot be allowed to become themselves the objectives.

IMPERFECTIONS.—The perfect paper has never been written. We may, however, exclude perfectionism from our evaluations and remind ourselves that even though we judge a pupil on the best of evidence to have attained maturity we shall still encounter in his writing "slips" or oversights which look disastrous indeed. How are such to be judged?

In the first place, be it noted that we are concerned with customary writing and not with the merit of a particular paper.

More than that, there is to a degree a specific psychology of "slips." In the mature writer, especially if the writer is a young person, sheer subconscious association or previously conditioned responses account for many of them. The reasonable evidential basis ever is the issue, Does the blunder consistently recur?

Oversights may, on the other hand, be evidence of immaturity provided the revelation is to the effect that the pupil does not consistently proof and revise his writing.

CONTENT AN IRRELEVANT ISSUE.—One occasionally encounters schools in which the English department allows "50 for content and 50 for form." Now this confuses the issue. We are concerned in our judgment with written expression and not with the validity of the content of the expression. A paper in economics, for instance, may conceivably be grossly bad doctrine and still be impeccable discourse. Nevertheless, papers which are sound in discourse tend as a matter of mere circumstance to be good in content.

RELIABILITY.—To what extent can teachers during the junior-college or senior-high-school period agree in applying a process of judgment such as the foregoing?

Unless the teachers themselves are thoroughly mature in their

command of the language, they will not agree at all well and even so their agreement on a given series of papers as a matter of evidence will not be worth much.

When the teachers are competent, they must agree within a comparatively narrow margin of uncertainty, well enough to guarantee that most pupils will be graduated as trustworthy and respectable writers in the place of graduations on the basis of credits earned on an average performance basis with no assurance whatever that there is present in any case any lasting learning product.

CHAPTER XXVI

PURE-PRACTICE TEACHING

IN learning which falls under the science and practical-arts types, progress seems to be won strictly through the process of reflection. The objectives are insight in the one case and insight associated with the manipulation of materials or appliances in the other. In the appreciation type, the good, the beautiful, and the true are presented to the pupil in such form that he can accept them and adopt them into his scheme of values. In the language arts, the pupil practices with the reception and expression of meanings through symbolic discourse until he reaches adaptations in terms of which he receives or expresses meanings in discourse without inhibition. There is, however, still another form in which learning arises through sheer repetition with little or no thought element involved. To this type we assign the designation "pure practice."

I

DIFFERENT FORMS OF PRACTICE.—Now learning in all the types is largely dependent upon practice. The long assimilation periods which appear in the other types are essentially practice with assimilative materials, but in each of them there appears either the perception of meaning in some form or the reception or expression of meanings. In the new type which we are discussing, there is apparently no appearance of perception of meaning as a part of the learning process. To be sure, there may be meaning as part of the motivation: We should not undertake to learn to swim, for instance, unless the art had a meaning for us in terms of some kind of ultimate utility. The art itself, however, has no thought content but is simply a process of neuro-muscular adjustment. Similarly, in fixating the image of a word spelling, the word itself of course has meaning but the meaning is not important in

establishing the image. The fact that the word has meaning is important in making its spelling a permanent possession, for otherwise it would have no functional use. As far as practice is concerned, we can picture to ourselves its use in learning somewhat in accordance with the following classification.

Practice

Assimilation

Science type subjects

Appreciation subjects

Practical arts subjects

Language-arts subjects

Repetition or drill

Pure-practice subjects

The distinction has more than academic significance. Teachers in some science-type subjects, mathematics for instance, frequently remark anent classes whose learning is incomplete "They need more drill." In most such cases, the pupils need not drill but study. If the teacher were merely indulging in an uncritical and inexact use of words, we need not object greatly, but on the contrary his terms are prone to be fatefully exact and he does proceed to drill, with the result that the pupils acquire a certain facility without understanding.

Nevertheless, pure practice, not assimilative practice, is our main reliance for the development of the skills associated with all the types which have bases in meanings. Given, for instance, a certain stock of mathematical learnings, the practitioner in their use acquires a marked facility as he applies them to all kinds of situations which he is called upon to solve. Similarly, the physician who is equipped with a stock of learnings appropriate to all ordinary cases becomes expert or skilled through much practice in applying them to the cure of patients presented in his ordinary experience of human maladies. In dealing with the ordinary round, he is probably much more skilful than his more learned colleague who has had less experience. Again, expert workmanship in the field of the practical arts is dependent upon

much repetition in the application of adaptations which the artisan has acquired.

The application of repetitive practice to the attainment of skill in situations in which a great deal of reflection is required may perhaps be made more convincing to the reader by citing common experience in the development of skill in such essentially thinking games as chess or various forms of whist or some of the better solitaire card games. Here the adaptation is in the learning of the game itself. After a very simple learning process, we discover that expertness depends chiefly upon practice. To be sure, in the course of experience, additional adaptations are found and mastered, but we find that facility and expertness depend upon practice. If we intermit playing for a time, our game falls off. If we resume, it catches up, even though the most careful scrutiny fails to disclose that we have adopted any new methods.

THE LEARNING PRODUCT.—The instances cited then have to do with skills which are developed by practice upon the basis of adaptations acquired in other types of learning. On the other hand, there are adaptations which are themselves acquired by simple repetition and these are the characteristic forms of learning which are found in the pure-practice type. Further, it should be added, we find skills which are developed by practice on adaptations of the type last named as truly as are other skills developed in the adaptations of other types. It is with the pure practice adaptations as essential learnings in the process of general education that we have to do in the present chapter.

Our objectives here are of two subtypes: (*a*) Neuro-muscular abilities, (*b*) Automatic response to ideational or sensory stimuli.

Adaptations of the first subtype are the most primitive learnings which the organism acquires. We find illustrations, as we have seen, in walking, swimming, skating. We might add to the list a great many purely physical accomplishments such as bicycle-riding, ball-tossing, different forms of dancing, and the like. Numerous items in the general field of the practical arts and vocational training are pure-practice adaptations, milking

for instance.¹ Harnessing a horse, however, is a practical-arts type of learning.

We find few instances of this subtype in the schoolroom, but we do find them in connection with the language-arts type. The most conspicuous instances are found when it becomes necessary to train the vocal organs to an appropriate form of action in either a foreign language or in vocal music; and when the fingers must be trained to a needed form of action on the keyboard of typewriter or piano. These seem to be true pure-practice adaptations. Again, in the case of penmanship, we have an art which is acquired subsequent to the language-arts handwriting adaptation. It utilizes the art of handwriting but as far as the learning process involved is concerned, it seems to be essentially a different art entirely.

It is important to distinguish here between the pure-practice adaptation in voice training, fingering, and penmanship, and the language-arts adaptations with which they are associated. The former are not language-art skills built upon the latter. They are separable arts. The child learns to sing, that is, to give expression to a musical meaning. If he is economically and effectively taught, the result is a language-arts product achieved by language-arts methods. It subsequently becomes necessary to modify the use which he makes of his voice. The new objective is not a language-arts but a pure-practice objective. A child learns to express himself in handwriting and so achieves a language-arts objective. His management of word forms, spacing, rate, and the like are, however, all of them strictly limited by his untrained neuromuscular organism. In order to train that organism, we must use the appropriate pure-practice procedure. And so with the voice training which may or may not be required in the use of

¹A very considerable amount of psychological investigation of the learning process seems to me to have been inconclusive in its outcome, and probably misleading, for the reason that it tends to rest on the assumption that all learning is of the same nature as pure-practice learning.

a foreign language or the fingering which may be essential to expertness in typewriting.

Adaptations of the second subtype are found especially in spelling, in automatic control of number tables and the number space in arithmetic, and in purely memoriter control of such matters as formulae, rules, and the like, paradigms in grammar, frequently-used constants in the sciences, dates in history.

II

FUNDAMENTALS OF TEACHING.—Teaching technique in the first subtype has much in common with language-arts technique. It is the same in that no reflection is involved in the learning process itself; it is different in that the language-arts objective is a matter of dealing with thought content while the pure-practice objective in itself has no thought content. The language-arts inhibition has an analogue in the pure-practice inhibition but in the former case the inhibition tends to divert the learning process to a different type of objective, namely deciphering ability, while in the latter the inhibition tends to hinder or stop the learning process. It does not divert the learning process. The law of initial diffuse movements applies with perhaps equal force to both types.

CHARACTERISTIC INHIBITION.—A certain swimming teacher gave this succinct and comprehensive piece of instruction, "Jump in and kick, kick, kick." In so doing he exhibited perfect comprehension of the learning principle at work and avoided completely the introduction at the outset of the pure-practice inhibition. His auditors were no doubt conscious of what the art of swimming is, for they had watched others.

Now if he had begun by giving his class a lecture on the movements required in swimming, what you must do first and what next, and had succeeded in making such instruction register so that the learner on entering the water had undertaken to learn as a conscious process in which the question, "What is the first

stroke and what next" was always focal, the inhibition would have been set up, and no learning at all would have taken place. In due season, most of the learners would have ignored the instruction and begun practice under the stimulus of contact with the water. On the contrary, what the teacher actually did was to set at work the principle of initial diffuse movements with gradual selection of the effective movements. In due season the law had its way and the swimming adaptation appeared.

In the various experiments with ball tossing cited in the psychological literature, the initial movements are crude—the balls are dropped, sometimes none of the balls is in the air while the learner is "thinking about it," but little by little practice makes perfect until the goal of subconscious performance is reached.

So it is with all teaching where the objective is a pure-practice objective of the first subtype. The learner is set to practice with the goal itself as a focal content in consciousness. So long as he practices with intent to achieve the goal he will eventually clear up his random movements and arrive. Certain qualifications however need to be observed.

RECOGNITION OF GOAL.—In the first place, the goal must be recognized and there must be intent to reach the goal. If the pupil is simply given formal exercise work, such, for instance, as two hours daily piano practice, progress will depend upon the chance that the learner discovers for himself the goal and thus establishes purpose or intent. Hence, as an initial step in the learning, the pupil must be made conscious of the goal by observing performance at the level of the adaptation sought. In the swimming class, consciousness of the goal can be taken for granted, for everybody knows what it is to swim. In the piano class, on the other hand, it may be that a given pupil is wholly unconscious of what it is all about. Consciousness of the goal should therefore be guaranteed at the outset.

You see how my fingers move on the keyboard. I do not have to stop and think about where I place them. I play without noticing my fingers. Now I had to practice a long time before I could do that. You

can already play very nicely these simple things, but your fingers are not yet musical fingers and so I am going to give you some exercises to limber them up.

CONSCIOUSNESS OF PROGRESS.—Again, the pupil needs to be made conscious not only of progress but of the nature of the progress. In penmanship, for instance, he can always compare his product with that of the penmanship scale, and he can keep a tabulation of the gain in his rate. In pure-practice learning of this nature, however, there tends to form after the initial spurt a long level of little improvement. If the pupil is ignorant of this principle, he is apt to become discouraged. If the teacher is ignorant of it, she will tend either to think that the pupil has reached his maximum attainment or else that he is not trying. Pupil and teacher alike, when duly aware of the nature of the progress to be expected, will not become discouraged and the pupil will keep patiently practicing, confident that in due season the final spurt which leads to the expertness required will come.

INHIBITORY CIRCUMSTANCES.—While the effect of making the learner focally conscious of his movements is to set up the inhibition characteristic of the type, there are often occasions when the pupil must be made aware of circumstances which are in themselves inhibitory. Target practice with small arms is a pure-practice type of learning, but if the learner is unaware of the influence of wind blowing across the line of fire, he will be a long time making the requisite adjustment, and gains made on a windy day will tend to spoil shooting in a calm. Hence, the instructor makes the learner aware of the inhibiting circumstance and the latter begins to practice with conscious allowance for wind drift. If, on the other hand, the instructor merely lectures on the theory without making specific application to the practice in hand, such as "Aim up wind about so much and then creep in" the learner will profit little or nothing. The principle is illustrated in the experiment cited in Judd's *Psychology of Secondary Education*, p. 308. Here two groups of children practiced shooting at a target under water. One group was instructed

in the principles of refraction and how the apparent displacement is produced, while the other group was left to its own devices. No difference in the learning rate of the two groups was noted. The situation was the same as would be the case if the swimming instructor should lecture on the principles of buoyancy in the human body when it is in motion in water. Now, when the conditions of the experiment were changed, after the first learning had taken place, by increasing the depth of water, the group which was aware of the principle involved and its practical bearing had a distinct advantage over the other group. The French Canadian, in instructing his baffled pupil in the deplorable art of shooting fish, makes the latter aware of a necessary correction when he exclaims "You got hit heem where he ant." Neither teacher nor pupil in this case knows anything about the theory of refraction. In this whole matter of inhibitory circumstances, pure-practice teaching approaches the confines of true practical-arts teaching.

In general then, the technique in this subtype is a process of making the learner aware of the goal, of enabling him to check and understand his progress, and of making him aware of inhibiting circumstances. Otherwise, the learner is left alone.

Objectives of the second subtype, that is, automatic response to sensory or ideational stimuli are much more common and much more important in the field of general education than are those of the first subtype to which we have been giving our attention. Among the objectives of the second subtype, the learning of spelling and automatic response to the fundamental number facts are pre-eminent.

III

SPELLING.—Spelling is, of course, primarily a matter of usage in English expression. In practice, the teaching of spelling has to be separated from the routine of usage teaching for two reasons. In the first place, as we have seen, while the pupil's discourse does not evolve fast enough to make the teaching of the limited number of usages which the educated person uses at all a formidable

matter, his active word vocabulary at the beginning of the secondary period has already evolved to the extent of several hundred words and is still rapidly developing. The images of correct spellings in much of his vocabulary are, however, either vague or incorrect and he still has to develop the sense for word forms upon which most of his later spelling will have to depend. Further, while most if not all his usage principles are the product of science-type learning, in which thought processes are involved, his spelling is the product of pure-practice learning in which images are established quite independently of thought content.

Training in spelling should probably not begin until the reading adaptation has been well established, since otherwise such training is apt to set up word consciousness in the field of reading.

The initial problem is to decide upon some principle of word selection which shall govern the formation of spelling lists. Now if we recall the principle that the problem is to weave usage into the pupil's active discourse, both in usage principles and in spelling, we find a ready basis in principle for the selection of such lists. Such lists should ideally be made up of words which are in the pupil's active vocabulary, that is words which he uses, not words which he understands but does not use. Hence, the pupil's spoken discourse and his written papers, especially the latter, are the source from which we can best make our selections. The reader is entitled to some explanation and defense of the principle thus set up before going farther.

We are teaching the correct spelling of words in order that the pupil may use them correctly. Here, as elsewhere in education, we are engaged in the process of adjusting the pupil to a world which is his world here and now. It is only by reacting to this present world of his, as the pupil grows from year to year, that he will eventually acquire the capacity for reacting to the new world which he must meet in later life. Hence the process of acquiring the correct spelling of words which he uses in his discourse is part of the process of adjusting him in terms of his discourse to the world which he at present encounters. The pupil

makes a correct spelling his own in proportion as he uses it. Otherwise, it becomes simply a part of his stock of lesson-learnings. Whether it then simply fades out of existence as a memoriter acquisition or is carried on as a mere eruditional content, the result is much the same. In neither case is it a contribution to the stock of adaptations which in the end make him an educated person. The first of the two possibilities is the more likely to occur: the word is simply memorized and the memory soon fades.

The spelling book of the older day was an excellent illustration of the prestige of organized knowledge, of the confusion of education with erudition, to which we have frequently referred. Here were some spellings which with sufficient motivation and practice could be memorized. The youth who could spell down his competitors was acclaimed by the naïve laity as a marvel of education. It mattered not that some of the words were technical expressions, whose meaning the child could not comprehend either then or later, and that other words had meanings which were comprehended, to be sure, but were no part of the child's present discourse. That day has largely been left behind. Our standard spelling lists are now much better arranged to meet the discourse needs of the average child. Nevertheless, the principle itself still remains. It boots not to assign a word which is part of the active vocabulary of the average child in the sixth grade in the United States, if it is no part of the active vocabulary of Willie Jones in the sixth grade of the Washington School in Boston or Chicago or Seattle.

Still less is it wise to assign that word to Willie if it is part of his vocabulary and if he already uses not only it but most words correctly. To do so is not only a waste of time but is to further Willie's conviction that learning is successful performance in the classroom. Hence, the principle of economy in teaching and the steady inculcation of right notions of educational values. Economy goes farther than avoidance of words which have already been taught and learned; it covers also words which have been learned but not taught. From the beginning of school-life chil-

dren pick up the correct spelling of many words, perhaps most words, and in later life the educated person applies the process to nearly all words.

Now, the pupil's active vocabulary expands as his intellectual contacts expand. If he is the child of a cultivated family, his vocabulary will tend to be much richer than that of his contemporary who belongs to the home of meager cultural life. If another reads widely, his vocabulary will expand more rapidly than that of his playmate who reads not at all. If certain children are studying content subjects under a procedure which calls for much reading and stimulates a good deal of discussion, their vocabularies will become enriched more rapidly than will those of other children whose daily routine is a matter of lessons learned. The essential point to be kept in mind in organizing spelling lists is that the normal enrichment of vocabulary arises chiefly out of the enrichment and organization of ideational content and only incidentally out of words considered in isolation.

As soon then as a group of children has definitely reached the reading adaptation and has begun to write, the problem of the word list is reached. For some time, there will be comparatively few misspellings, for the reason that the active vocabulary is composed of easy words and is still rather limited. There will be some misspellings, however,—enough to make a spelling program desirable. Instruction will be largely individual corrective work.

As soon as the pupils have begun to read widely and to get broader contacts in various directions, perhaps at third-grade or fourth-grade level, their active vocabularies tend to expand, or rather perhaps many words will begin to transfer from the passive to the active vocabulary. The teacher who is unaware of the principle at work becomes appalled at the pupil's bad spelling. As a matter of fact, he spells as well as he did before, but he is using new words which he has not learned to spell. A more systematic program becomes necessary. The ideal plan is to make a study of the pupils' written papers and to prepare word lists for each pupil. It goes without saying that such papers

should be found in the regular paper work of the content subjects. If several different papers for each pupil are utilized, we shall get a fairly complete picture of his present working vocabulary. A more expeditious but less exact plan is the following.

A standard word list scientifically determined for the approximate grade under consideration is taken and the words found therein are carefully checked by the teacher and only the words retained for teaching which she is sure are in the active vocabularies of the greater portion of the class. To the list thus formed are added other words which she is sure are also to be found in their active vocabularies. The teaching list is thus built up.

PRE-TEST.—The list thus formed is divided into convenient blocks, let us say of 25 or 50 words each. The first block is subjected to a pre-test and this pre-test may take the time of the class in the period set apart for the purpose for one or more days. In pre-testing, the teacher dictates each word and then pronounces a familiar sentence in which the word occurs in its proper meaning. Thus: "There." "There are thirty children in this room." "I place the book there." At the conclusion of the test we shall be likely to find a situation something like that pictured in Table XIII.

Let us see what we can make out of the results.

In the first place, we note that 4 pupils miss no words. They are accordingly released for other work or other interests. Again, five words are missed by nobody. We have for the present no further concern with them.

Nineteen pupils miss three words or less and to these pupils we shall give some attention. In the cases of all who have missed only one word we recognize pupils whose record of misses seldom exceeds one or two words. They are individuals who have fairly well developed word sense and we exclude them from the group which is to be gathered for class teaching. They will work on individual word lists of the words missed, and on the list as a whole. The same is in general true of Nos. 6, 10, 15, 17, 24, 27, 30, and 31. They are also assigned individual lists. The remain-

TABLE XIII

PRE-TEST

PUPILS	WORDS																									TOTAL MISSES
	Almost	Ill	Sweeten	Subtraction	Blaze	Hump	Sign	Silent	Alley	Skipping	Strife	Below	Races	Barley	News	Bullet	Lime	Cinder	Case	Preach	Blot	Brass	Prairie	Tender	Team	
1.....	x			x		x					x			x									x	x		7
2.....					x					x				x				x					x		x	6
3.....			x				x																			2
4.....	x			x						x	x			x												5
5.....				x							x															11
6.....					x				x														x			3
7.....																										0
8.....				x																			x			11
9.....							x	x															x			3
10.....			x																	x						2
11.....	x		x	x	x											x		x					x			7
12.....																										0
13.....																										0
14.....																										0
15.....												x		x												2
16.....							x				x											x	x			4
17.....														x									x			2
18.....																							x			1
19.....																							x			1
20.....			x																							1
21.....			x	x																			x			3
22.....										x																1
23.....																							x			1
24.....					x											x							x			3
25.....			x	x			x				x			x		x		x		x			x			9
26.....							x				x											x	x		x	5
27.....			x											x		x										3
28.....										x							x			x		x	x		x	6
29.....				x			x			x													x			4
30.....																	x			x			x			3
31.....											x						x						x			3
32.....							x																x			2
Total.....	3	0	7	8	4	0	8	1	1	5	7	1	0	7	1	5	1	3	0	4	0	3	20	1	3	93

ing 6 of this group of 19 pupils are usually found to have made as many or more misses on pre-tests. Their word sense is still defective and they need the training implied in the presentation technique described below. Summarizing, we find in the section of 32 pupils: 4 pupils who miss no words at all; 13 who are given individual lists; and 15 who are assigned for group teaching.

Turning now to the words, our attention is first attracted by "prairie." We suspect that it may not be in the active vocabulary. The children, however, live in a part of the country where the word is in frequent use, they are encountering it in their geography, and we find it now and then in their papers. If not actually present in their working vocabularies, it is on the point of becoming so. Perhaps in the revision of this word list we shall postpone it to a later month or perhaps year. However, we find later that the word is missed but once in the final test on the block (see page 557), while "blaze" is missed twice in the final test, and "races" and "blot," which showed no misses on the pre-test, are missed once each on the final test.

Ten of the words which are missed at all on the pre-test are missed three times or less. The indications are that these words are not difficult at this stage and, if subsequent experience confirms the result of this pre-test, we shall move them back into earlier lists, since all of them are probably in the active vocabularies of younger children. For the present, we shall utilize them in our group instruction, both because we shall do well to make sure and because they are available for the purpose of developing word sense in terms of the images which we discuss below. The same reasoning will apply to words which are missed more than three times.

Seven words, namely, "sweeten," "subtraction," "sign," "skipping," "strife," "barley," "bullet," are distinctly hard words for this section and at this stage, and in the cases of the first five and last we can easily see why they are hard. We have some doubt that "barley" is really part of the vocabulary of the class in general. If it were left out, the pupils would probably pick up

the spelling later. Apparently the teaching as such presents no special difficulties.

To resume then, we have a teaching list of 20 words and a teaching group of 15 pupils.

PRESENTATION.—Let us turn now to the presentation in spelling.

Retention of the correct spelling of a given word seems to be a matter of the establishment of a complex of four images. We recall a spelling as a set of letters which have been seen together in a word form; associated with the same form vocalized; with the letters orally named in a certain order; with a word pronunciation and letter naming which have been heard; and finally with the word as written. We may designate these several images in brief as the visual, vocal, auditory, and handwriting images. The problem is to establish these images vividly and to establish the associations between them.

The reader can verify the importance of the images by noting his own reactions in the cases of words which are still vague in his system of recall. We encounter such a word in writing. Instantly our tendency is to make an effort to remember how the word looks. Not satisfied, we call into operation our vocal organs by spelling the word out. Or, if we have a brief forewarning of the use of the word and vainly endeavor to recall, the act of writing itself will often clear up the difficulty and give us confidence in the right spelling. In brief, we automatically call to our aid all the possible images. If we are still not confident, we cut the Gordian knot and look it up. It is interesting to note how experience with many wrong images will tend to break down the images which have been established. The teacher who has to work with papers which contain many misspellings soon loses confidence in his own spellings and finds himself going, half ashamed, to the dictionary for the spellings which he really recalls perfectly well.

Now, the psychology of image establishment is familiar. It is essentially a matter of vivid perception, of intensive repetition, and of long practice in use. Reflection plays no part, but on the

contrary, tends to set up an inhibition. If we say to the pupil, "This is the right way to spell 'business': remember not to spell it 'buisness,'" he will hesitate in embarrassed confusion and more likely than not will react with the wrong spelling, simply because the warning has made the wrong image the more vivid. The adjuration "to think" may help in arithmetic; it is apt to be a hindrance in spelling.

With the teaching list in hand then, the teacher selects a very few words for the day's practice. A good rule is perhaps three in the third grade, four in the fourth, and not more than five in any grade. The important consideration is not to attempt to practice on so many words at a time that the images cannot be made vivid and intensive.

The class is then gathered close to the board so that each will have the board space to be used clearly in his field of vision. All distracting drawings and writings are removed from the board. The teacher waits until she has 100 per cent control technique.

Suddenly she turns and writes clearly and distinctly in syllabic form the word, sub-trac-tion. She pronounces clearly and distinctly, slightly exaggerating the phonetic value of each syllable.

Several pupils are called upon in succession to do the same. If the values are not vivid as the pupils vocalize, the teacher pronounces again, perhaps several times. Finally, the class vocalizes in unison.

The teacher then says, "Write" and the pupils write the word on small slips of paper.

Thus there have been presented vividly the four images and all children have reacted to each of the four.

WORD SENSE.—In many words the vocal image is especially important. It is easy to see that many misspellings are traceable to bad pronunciation. For instance, "subtraction" in our list is often vocalized "substraction" and is more likely to be misspelled thus than otherwise. Further, it is probably true that word sense is built up chiefly through practice in vocalizing words whose vis-

ual images are clear. Thus there is contributed a valuable element of language learning which cannot easily be acquired on language-arts principles and likewise the basis on which independent spelling ability is built up. Obviously the pupil cannot go to school all his days to learn the spelling of all the new words which he encounters. Word sense once established, however, he is inclined to apperceive new words in their correct spellings and to react with correct spellings. In brief, in learning to spell words he also learns to spell.

The process is continued with each of the words in the day's list and, when all have been thus presented, the papers are turned and the teacher dictates the words in column as in the pre-test, each word being followed by a typical sentence in which it is used in its meaning. The pupils write the words, but not the sentences. Thus the teaching test. If the spellings of the class as a whole on this teaching test, ignoring the definitely identified problem cases, are less than 97 per cent correct or thereabout, the test results are analyzed. If misspellings are scattered among the words of the day's list, then the list as a whole is made the list for the next day. If, on the other hand, the misses are limited to one or more words, these words only are made parts of the list for the next day. The reader will perhaps raise the question, Does not this process waste the time of the great majority who have learned the words? We think not. Let us recall that the learning process here is quite as much a matter of learning to spell as learning to spell words. In other words, practice in building up fundamental word sense is as valuable as recognition of right spellings of individual words. Words which are already recognized are on the whole more valuable for this purpose than those whose images are still vague. The pupils who were selected for teaching by the pre-test are pupils whose word sense is evidently still in the process of formation. The dividing line of 97 per cent has no significance in itself; it simply allows a reasonable margin for errors which are in the nature of slips of the pen rather than true misses.

And so the process is continued day by day until the teaching list has been exhausted.

Meantime, the pupils who have been released from group instruction are studying their individual lists with the understanding that they will be recalled for the final block test. They are told to study their words in much the same manner in which the class studies the list set for group instruction and not to give over until they are sure that they can spell each word right under any and all circumstances. Such pupils will ordinarily accomplish the task in a fraction of the time which the teacher devotes to the class group and opportunity is given for reading or other study. High motivation is thus set up and it is motivation of the right type, since it is obviously in terms of mastery of a learning product rather than in terms of relative performance on a test in which few if any actually master.

FINAL TEST.—When the group teaching has been completed, the class as a whole is brought together for the final test on the block as a whole. Typical results are exhibited in Table XIV.

Let us see what the exhibit has to tell us.

Pupils 7 and 13, who were released entirely after the pre-test, justify themselves on the final test. Pupil 14 does not justify himself. Pupil 12 was released on the pre-test but is absent on the final test. We note the miss of Pupil 14 on the word "below" and conclude that the miss was a real one, since he spells it with two l's. He is given this word for individual practice. We shall watch this tendency to make a miss on the final test not made in the pre-test and shall perhaps on later blocks include him in the presentation group for practice on the images.

Pupils 6, 10, 15, 17, 18, 19, 20, 22, 23, 24, 27, 30, and 31 were released for individual study. All but Pupil 20 make perfect scores on the final test. Pupil 20 misses one word on the pre-test and a different word on the block test. It may have been a slip of the pen in the latter case, but we note him as possibly needing image training. He practices "races" further. We may find on the next block test that he plays the same trick. In that case, we

TABLE XIV

BLOCK FINAL TEST AND COMPARISON WITH PRE-TEST

PUPIL	WORDS																								TOTAL MISSES		
	Almost	Ill	Sweeten	Subtraction	Blaze	Hump	Sign	Silent	Alley	Skipping	Strife	Below	Races	Barley	News	Bullet	Lime	Cinder	Case	Preach	Blot	Brass	Prairie	Tender			Team
1.....	x			x		x					x			x									x	x	7	A*	
	o			o		o					o			o									o	o	o	o	B*
2.....					x					x				x				x			o		x		x	6	A
				o						o				o				o			x		o		o	1	B
3.....			x				x																			2	A
			o				o																			o	B
4.....	x			x						x	x			x												5	A
	o			o						o	o			o												o	B
5.....				x							x															2	A
				o						o																o	B
6.....					x				x														x			3	A
				o					o														o			o	B
7.....																										o	A
																										o	B
8.....				x																			x			2	A
				o																			o			o	B
9.....							x	x															x			3	A
							o	o															o			o	B
10.....				x																	x					2	A
				o																	o					o	B
11.....	x		x	x	x											x		x					x			7	A
	o		o	o	o											o		o					o			o	B
12.....	Absent																								o	A	
																										B	
13.....																									o	A	
																									o	B	
14.....																									o	A	
																									1	B	
15.....																									2	A	
																									o	B	
16.....																									4	A	
																									o	B	

* A = Pre-test.

B = Block Test.

TABLE XIV—(Continued)

Words	Words																									Total Misses	
	Almost	Ill	Sweeten	Subtraction	Blaze	Hump	Sign	Silent	Alley	Skipping	Strife	Below	Races	Barley	News	Bullet	Lime	Cinder	Case	Preach	Blot	Brass	Prairie	Tender	Team		
17.....														x									x			2	A
														o									o			o	B
18.....																							x			1	A
																							o			o	B
19.....																							x			1	A
																							o			o	B
20.....			x											o												1	A
			o										x													1	B
21.....			x	x																			x			3	A
			o	o																			o			o	B
22.....										x																1	A
										o																o	B
23.....																							x			1	A
																							o			o	B
24.....					x											x							x			3	A
					o											o							o			o	B
25.....			x	x	o		x			x				x		x		x		x		x				9	A
			o	o	x		o			o				o		o		o		o		o				1	B
26.....					o		x			x												x	x		x	5	A
					x		o			o												o	o		o	1	B
27.....			x											x		x										3	A
			o											o		o										o	B
28.....										x							x			x		x	x		x	6	A
										o							o			o		o	o		o	o	B
29.....				x			x			x													x			4	A
				o			o			o													o			o	B
30.....																x				x		x				3	A
																o				o		o				o	B
31.....										x						x						x				3	A
										o						o							o			o	B
32.....							x																x			2	A
							o																			1	B
Total...	3	o	7	8	4	o	8	1	1	5	7	1	o	7	1	5	1	3	o	4	o	3	20	1	3	93	A
	o	o	o	o	2	o	o	o	o	o	o	1	1	o	o	o	o	o	o	o	1	o	1	o	o	6	B

shall regularly include him in the class-practice group for a time. Thirteen pupils who work on individual lists, three words or less each, make 26 misses on the pre-test and 1 on the final test; the 15 pupils in the class presentation group make 67 misses on the pre-test and 5 on the final block test. Evidently the pupils who were released and held responsible for a few words each accepted the responsibility very fairly well. The 15 pupils who compose the class presentation group missed 3 words on the final test which were not missed by the same individuals on the pre-test.

There are no problem cases in the group. Pupils 1, 11, and 25, who might reasonably be suspected on the showing of the pre-test, exhibit satisfactory learning. Pupil 1 makes an aggregate of 2 misses on the several teaching tests (not shown here) and the other two make none at all.

Let us turn now to the word misses on the final block test. "Blaze" is missed four times on the pre-test and twice on the final test, but both the latter misses are at the hands of pupils who did not miss the word on the pre-test. The same situation appears in the cases of all words but one which are missed on both tests. The trouble is not with the words but with the pupils. The exception is "prairie," in the case of which the one miss on the final test is made by a pupil who missed the word on the pre-test. Since the misses on this word drop from 20 on the pre-test to 1 on the final test with only two misses on teaching tests, evidently the word is not difficult.

Now, we might have found one or more problem pupils, children who are responsible for the greater part of the misses on the daily teaching tests and who come through with as many or nearly as many misses on the final test as on the pre-test—sometimes more on the former. These people have to be set aside for study.

Or we might have found one or more words which show similar characteristics. Such words are spelling "demons," and they are included in the next teaching list and so on until they are conquered. If a "demon" is in the active vocabulary of children,

the earlier it is attacked the better. There is no sound justification for deferring a word to a later year simply because it is difficult. Such a word, if in the active vocabulary, will become steadily more a "demon" through practice on defective images. If it is not in the active vocabulary, it will not be taught until it appears therein, but neither will an easy word.

FUNCTIONAL TEST.—There remains the issue, Will the pupil use the correct spellings which he has thus learned in his ordinary discourse? Hence what we may call the functional test. Now there is obviously no possibility of a functional test if we have been teaching words which are not in the pupils' active vocabulary. To apply the functional test, we must examine the written work of pupils, utilizing, as far as we can, writing which has been done in wholly unsupervised situations.

We shall find that some pupils use correctly words which have been cleared up in the spelling lessons and others do not. Misspellings found in the discourse of the latter are pretty apt to fall into either one of four classes.

1. The pupil can spell the word correctly but will not make the effort.
2. He intends to spell correctly but is careless.
3. He has learned the correct spelling only as an exercise in spelling and the spelling does not transfer to use. In other words, he exhibits the lesson-learning attitude.
4. He has not learned the correct spelling.

In general, the invariable practice should be to glance rapidly over all papers submitted and hand back papers which show inexcusable spellings, with the simple injunction, "There are some inexcusable misspellings in your paper; correct them." Such action will probably be included in the injunction to correct inexcusable errors in usage discussed in the last chapter. It should of course be accompanied by admonitions on the subject of carelessness and slovenly work in general. The associated teaching objective is volitional in character: we are focusing on the inculcation of ideals of carefulness and thoroughness as well as upon spell-

ing. If the tradition grows up, as it rapidly will grow up if all teachers are faithful and diligent, that careless and slovenly work will simply not be accepted at all, the type of paper represented by the first two classes noted will rapidly disappear. The vigilance of all teachers cannot, however, safely be relaxed from the beginning of the secondary period to the end, or to the point at which the pupil's character has become definitely formed. Education is a stern process for the learner as well as for the teacher and it is long before the youth ceases to be inclined to choose the pathway of least resistance.

It is not easy to identify the lesson-learner and to be reasonably sure that we have differentiated him from the careless pupil. Let us bear in mind that lesson-learning seems to be in itself rather a definite attitude toward learning. The pupil does not realize that what is learned in the classroom has any relation to what goes on outside the classroom. There are various symptoms which can be noted.

In the first place, such a pupil is likely to be a lesson-learner in other subjects in which it is easier to identify him by direct testing. (See chapter iv.)

When a paper is handed back for correction, the lesson-learner will sometimes change words and usages which are entirely correct, in his random attempts to satisfy the teacher. A variety of indications of this general type will often disclose to the observant and thoughtful teacher the character of the learning.

In studying the problem, the results of a specific test, taken in connection with other evidence, will often disclose the type. For this purpose, a list of review words is made up and dictated in column. At a later period, the same words are dictated in sentences. The lesson-learner will show a tendency to spell words correctly when they are dictated in column and to misspell when they appear in sentences, or at least to spell distinctly better on the column test than on the sentence test. The true non-learner, on the other hand, misspells about equally in the two tests and for the most part the same words.

When the lesson-learner is definitely identified, he becomes a problem case in this particular sense, usually corrective rather than remedial in type, and the teacher sets to work to make him realize what he is studying for.

The process of distinguishing the non-learner from the lesson-learner and from the careless or indifferent pupil has thus been noted in part. The non-learner is further likely to be refractory on both the teaching tests and the final test, while the other classes show a clean record on both. The non-learner is not necessarily a problem case, but rather a slow learner. If he shows steady improvement, the latter is probably the case. He is always kept in the class presentation group and in addition he makes up a list of words for individual study. On the other hand, the non-learner may show little or no improvement and in that case he becomes a remedial case.

PUPIL STUDY.—For the sake of the most thoroughgoing teaching and intensive study of the individual pupil problem, it is convenient and desirable to tabulate results on each block of words in something like the fashion suggested by the scheme which is exhibited in Table XV. We then have a sheet for each block for each pupil. The sheets are gathered in a loose leaf binder and thus an accurate record is assembled for the study of pupil progress and for the study and rearrangement of word lists.

REASONABLE EXPECTATIONS.—If this program of systematic training is faithfully and intelligently carried out, what may be expected? Of course the answer will depend somewhat on the school and upon its constituency. It will depend upon the richness of the intellectual background which the school is able to build up through a good kindergarten-primary, abundant reading material and well-organized courses in the content subjects. It will depend upon these elements in the experience of the pupil because upon them in turn depends the growth of the child's active vocabulary. Assuming that these matters are provided for much as this volume proposes, an outcome like the following may

TABLE XV

PUPIL'S NAME

DATES (PRE-TEST AND
FINAL TEST)

BLOCK No. _____ SCHOOL

Words	Pre-Test	Teaching Tests	Final Test	Function Test
1. Almost.....	x			
2. Ill.....				
3. Sweeten.....				
4. Subtraction.....	x			
5. Blaze.....				
6. Hump.....				
7. Sign.....	x			
8. Silent.....				
9. Alley.....				
10. Skipping.....				
11. Strife.....	x	x		x
12. Below.....				
13. Races.....				
14. Barley.....	x			
15. News.....				
16. Bullet.....				
17. Lime.....				
18. Cinder.....		x		
19. Case.....				
20. Preach.....				
21. Blot.....				
22. Brass.....				
23. Prairie.....	x			
24. Tender.....	x			
25. Team.....				

be looked for. It will depend most of all upon the fidelity and skill of the teachers.

1. There will be a period of much teaching required in the earlier years of the secondary period, let us say, the third and fourth grades and well into the fifth, as the process of training overtakes the active vocabulary, in respect to both recognition of single correct word spellings and to training in word sense.

2. During the fifth grade or thereabout, the number of pupil releases on successive teaching lists will begin to show a steady increase and so will the number of words omitted on successive blocks of words and the number of pupils working on individual lists. Correspondingly, the number of pupils in successive class presentation groups will show a steady decrease.

3. By the end of the sixth grade there will be few if any children left in the spelling classes save problem pupils who still show defective word sense, defective recognition of correct spellings for the active vocabulary, and a defective spelling conscience. An occasional misspelling may be found among the released pupils, and this will continue to be the case more or less throughout life, but there will be no systematic misspelling. Such occasional misspellings are ordinarily traceable to that particular lapse known as a "slip of the pen," or else to a sort of overlooking of an individual word. As in the case of usage principles, it is not a minimal allowable number of such slips or oversights which is the criterion, but rather the revelation which they offer, all the evidence being considered, as to the real character of the individual's spelling adaptation. If the pupil or older person regularly makes such slips or oversights, we must conclude that he cannot spell. The pupil has learned to spell when he uses correctly all words which he has learned, when he effectively desires to spell all words correctly, when he verifies all spellings of which he is uncertain.

IN HIGH SCHOOL.—What if we find, as we do find, a good many instances of chronic bad spelling in the seventh and later grades?

The *prima facie* assumption is that teaching in the earlier

years has not been faithfully and intelligently done. Especially is it probable that the earlier teachers have ignored or have been lax about the functional test and have not cleaned up their corrective cases. Or it may equally well be that they have been lax in accepting papers in content subjects which contain careless or indolent misspelling. Or again, it may be that content subject teachers in the junior or senior high school or college are accepting careless papers and are thus breaking down spelling morale.

On the other hand, a sudden access of intellectual interest in junior high school subjects may have rapidly expanded the active vocabulary beyond the rate at which the pupil's organized spelling adaptation will take up new words. This is especially apt to be the case when a pupil passes from a formalistic elementary school to a junior high school in which he suddenly encounters a broad range of intellectual content. In general, in this case two courses are open. Either the chronic bad spellers are identified as true problem cases of the non-learner type and a remedial group is organized for application of the regular spelling technique, or else each deficient pupil is required to form an individual word list and hold himself responsible for repairing his deficiencies. In no case is a regular course in spelling organized on the vague plea that "pupils at this age need it." When a school adopts such a course it assumes a responsibility which belongs to the pupil and it may rest assured that similar provisions will be equally appropriate up to and including the graduate and professional level.

The senior high school should have no deficient spellers except identified remedial cases. Nor should it accept such on the complacent theory that they must be remedial cases because they do not spell.

THE REMEDIAL CASE.—The corrective cases have already been dealt with. In an essential sense, the whole teaching procedure is founded upon identification and correction of faults in the normal learning process. There remain the definitely remedial problems.

Now these remedial cases may be traceable to causes which make the pupil a defective learner in any school subject. A given case may be mental and traceable to the fact that the pupil is of subnormal mentality. If so, he has no place in the school for normal children. It may be learning: the pupil has not mastered spelling when he should have done so, or it may be he is an obstinate case of lesson-learning. The cause may be emotional, or physical, or volitional in the general sense. If so, the pupil is quite as likely to be deficient in other subjects as in spelling. It may be psycho-physical, a vision or hearing case. If that is so, the consequences may rest with peculiar weight on spelling.

A true defective learner of the remedial type peculiar to spelling is likely to be a pupil who has some trouble with his word-image formation, and such trouble is in turn likely to be traceable to defects in vision or hearing, speech or handwriting.

A pupil who has defects in vision or hearing may still learn to spell because he has compensatory advantages. Defect in vision, for instance, may be offset by singularly acute hearing or kin-aesthetic images. The loss of learning power traceable to sensory defects may be made good by unusual determination. In general, however, a defect in any of these sensory fields handicaps the learner and may well result in non-learning. If then we find a pupil whose misses on teaching and final tests are abnormal and if he shows little or no improvement, we shall begin to study him as a remedial case.

1. His medical examination is looked up to see what his record was on vision. If his vision is found to be poor, remedial attention consists in persuading the parents to provide treatment by a competent oculist or in securing the appropriate relief through other agencies than the family. It may be stated in passing that, while the routine medical inspection will be likely to disclose all ordinary defects in vision, there are sometimes obscure defects which can be reached only by the specialist in this field.

2. Similarly, hearing is canvassed. Remedial treatment in this field is much less likely to be effective, because poor hearing is

often due to defects which cannot be repaired. Something can often be done, however. In cases where defective hearing which does not approach deafness is established, a simple reseating of the pupil so that the presentation can be taken at maximum audibility is usually helpful and may in time solve the learning problem.

3. Speech defects, by interfering with the development of normal word sense, may be causing difficulty. Early treatment by a specialist in this field is of course eminently desirable. Such treatment is, however, often not obtainable and sometimes it is ineffective. In any case, the retention of such a pupil in the presentation group in which so much emphasis is placed on vocalization is unlikely to be productive of learning and it may cause positive mischief. Accordingly, we fall back on the other images, especially vision and handwriting, and arrange a program of individual practice.

4. Defective handwriting is probably the cause of much bad spelling, especially when the pupil has never attained the handwriting adaptation and still draws instead of writes. When we reflect that practically all bad spelling is bad written spelling, the handwriting image, both in its visual and in its kinaesthetic aspects, looms large. Hence, when the pupil draws instead of writes, or writes illegibly, he tends to fail to form the images which he uses in the discourse which reveals his actual spelling.

The appropriate remedial treatment is obvious. The handwriting should be remedied for its own sake and because it tends to inhibit learning in spelling as well as in the whole language-arts field. The pupil is sent to the remedial teacher to begin his handwriting over again. Especially should inquiries be made to make sure that a normally left-handed pupil is not being made to write with his right hand.

Of course the handwriting defect is not strictly psycho-physical in character, but, in its tendency to block the formation of the handwriting image, the outcome is much the same as would be the case if it were psycho-physical.

5. The foregoing by no means exhausts the list of the causes which underlie the behavior of the so-called congenital bad speller.

The large majority of pupils, however, who are in reality remedial and not simply corrective cases and who do not classify as mental, experiential, physical, emotional, or volitional cases are remediable under one or more of the heads above enumerated. There remain unusual and obscure maladies or mental maladjustments which no doubt occasionally influence learning under any type and which lie beyond the scope of the present study.

IV

THE NUMBER FACTS.—The automatic use of a definitely limited field of number combinations seems to be fundamental to any assimilative experience whatever in the field of mathematics. We refer to the addition combinations of the digits, sometimes called the number space, and to the multiplication table up to 12. The establishment of such adjustments to automatic use is, like spelling, an instance of pure-practice learning of major importance. The reader should, however, have in mind a clear distinction between such automatic use and the fundamental number concepts.

Fundamental to any possible thinking in mathematics is the presence in the apperceptive mass of the primary concepts of number itself and of those combinations of number into other numbers which are obtained by adding, taking from, multiplying, and dividing. Such primary concepts arise to some extent out of the natural experience of childhood and to some extent the appropriate experiences must be provided in the early school life. These primary concepts are not the processes of addition, subtraction, multiplication, and division, nor is the concept of fractional parts coextensive with the notion of fractions. Now the acquisition of the primary concept does not call for the application of any of the types of teaching which are appropriate to the secondary period. It is a matter of providing experiences out of which

certain ideational content can arise and not a matter of organizing experience into coherent attitudes toward the world or into systems of thought. Practically speaking, the danger is that the pupil will learn to deal with figures before he has acquired the ideas of which figures are the symbols. Mastery, however, does apply, and an essential part of administrative technique is to make sure that children in fact do have these primary concepts before they pass on to the stage of pure-practice learning with which we have to deal in this chapter. (See also chapter xiii, p. 241.)

The objective in this particular portion of our field has been defined by implication above. Concretely, it is substantially that the pupil shall practice until such a combination as $4+7$ brings the instant response 11 and such a one as 8×7 brings the instant response 56. To put it in another way, the pupil who has mastered such automatic response has the image 56 in mind whenever he encounters the relation 8×7 . Further, the response is subconscious, or at least not focal. When the pupil has occasion to use the facts, as he does have occasion whenever he encounters an arithmetical situation, an ideational stimulus calls forth the appropriate number-fact response without interrupting the stream of thought which is applied to the problem itself.

Now a teacher in the later grades of the elementary period or even in the high school who comes upon a problem case in arithmetic frequently gives the verdict, "Does not know his tables," and the verdict is justified. The defect is likely to be one of three types.

1. The pupil in truth does not know. He cannot tell what 8×7 is because he has no system of recall which will give him the answer.

2. More often, even if he has the answer, he is obliged to set up a cumbersome system of recall. Such pupils will ordinarily be found to be repeating the table until they come to the required combination. They can recall only if they set up the rhythm in which they learned. You often see their lips moving as they rap-

idly repeat 8×1 is 8; 8×2 is 16; 8×3 is 24; . . . and so on until they reach 8×7 is 56. Now this pupil is handicapped in his essential arithmetic learning, which is a process of severe reflection, because his attention is distracted from reflection to the recall of number facts. At the best, he is a slow worker on assimilative material; at the worst, his learning is inhibited altogether.

3. Occasionally, perhaps more often than we think, the pupil responds with more or less facility to the number facts, such as 8×7 , but he is unable to use them in the reflective process because he is dealing only with figures and his figures do not stand for number concepts. Most problems require judgments in which number relations are the terms. For instance, the pupil has to decide whether 440×8 is greater or less than $5,280 \div 1.5$. He guesses because neither set of figures stands for any sort of valid reality in his mind.

TEACHING TECHNIQUE.—Once sure of the conceptual foundation, the process of making the responses automatic is a piece of pure practice, in which the pupils are trained to respond automatically.

No doubt, if there were time enough and motivation sufficient for the purpose, all the number facts would be rendered automatic in the manner which is theoretically best, that is, by repeating them in concrete problem situations. So does the worker at the vocational level who is dealing constantly with such facts as are best used automatically. The calculator, for example, sometimes finds that he is retaining in memory without effort the logarithms of numbers which are frequently used. But there is not time enough in the process of general education for this natural method of learning to operate, there is not motivation enough, and there is too much distraction in other equally important interests. Hence, a specific, artificial technique must be set up.

The first stage, begun in the primary school simultaneously with the forming of number concepts, is the learning of number space and the tables as a mere matter of recall. The technique

developed out of long experience and customarily used in schools is perhaps as good as any. The same system of image formation used in spelling is applicable. The child establishes images of $4+6=10$; $8\times 4=32$; $32\div 4=8$, and so on, as the result of many experiences visualized, heard, voiced, and written. Further he establishes them in a series of sequential frameworks of number concepts.

$$4+1=5$$

$$4+2=6$$

$$4+3=7$$

$$4+4=8$$

$$4\times 1=4$$

$$4\times 2=8$$

$$4\times 3=12$$

$$4\times 4=16$$

Further still, he establishes them as subtraction and division as well as addition and multiplication. He practices until the teacher is sure that he has his system of recall established and can use it forward and backward, as multiplication or division, addition or subtraction.

We need not go into the testing of this stage in detail. The method of testing which we have explained in spelling particularly, and indeed in both the science type and the language-arts type as well, applies here. The essence of the matter and the purpose of testing is an inventory of the pupil's reactions which will disclose: first, the points at which reteaching needs to be done; second, the pupils who have not yet mastered and the items in which non-mastery exists; third, the pupils who have mastered. The scored test of the class-group performance is not only wholly valueless for teaching purposes but it is often positively harmful and misleading. It is misleading because it identifies neither the pupils nor the items which need reteaching. It is harmful because it tends to set up in the minds of teacher and pupils both the passing-grade and the part-learning attitudes toward learning.

As soon as the number facts have thus been learned, both as conceptual content² and as systems of recall, the process of build-

²In should not be inferred that the entire range must be built up, by specific concrete experiences, as a body of conceptual content. Rather, the pupil practices with concrete material in the simple combinations which can easily be visualized

ing up automatic facility begins. One hundred twenty-one facts in the number space and 169^8 in the multiplication table constitute the field. If we add the related subtraction and division facts the number is doubled. The crux of the matter here is practicing response without time interval sufficient for conscious recall.

The quick perception devices with which most teachers in the early grades of the elementary school are familiar are the appropriate means. Probably the most serviceable device is the flash card. For this purpose the facts to be practiced are printed, or plainly written in round hand, on cards large enough for the purpose. The card and its inscription should be plainly visible from any part of the room.

The teacher selects a small pack of cards and exposes them one after another for a fraction of a second each, the class responding in unison. Thus " 7×8 " is the number fact exposed. The class responds "56." There must be 100-per-cent control technique and the movement of the cards must be smooth, clear, and rapid. At the moment of exposure, the card must be held perfectly still. The group under training must be so seated or gathered that the card is plainly and easily visible and so that it will not need to be moved laterally to bring it within the lines of vision of different pupils. The teacher will need to practice in exposing the cards until she can do so rapidly and with entire facility.

Now it may be necessary at first to practice with a single card until the pupils fall into step and make the instant response. The tyro in this work, in the moment of awkwardness at the beginning, often holds the card in view until she gets the response as a

and otherwise concretely experienced until the teacher is satisfied that he has generalized the notion of number as distinct from the symbols of number.

* Experimentation seems to show that, while many children infer the bond $2 + 1$, as a matter of automatic response, from the bond $1 + 2$, and the bond 4×3 from the bond 3×4 , others do not. Hence, for mastery purposes, the teacher needs to check learning on each bond on both its aspects. Further, to omit the bonds which include 0 is to leave a gap in learning which often proves singularly troublesome later.

matter of conscious recall. Of course this is no training at all. Better begin with a card such as 2×2 to which the children will respond as a matter of course, and then slowly increase the number of cards. If the response is not instant, the card is thrown to one side into a pile by itself and it is included in the practice for the next period. The children respond in unison, and, if some individuals tend to lag the fraction of a second and thus hang on the responses of the others, it does not greatly matter. They are practicing, and the defects in their practice will be corrected in the period of individual training which comes later.

It is convenient to divide the cards into packs, each pack corresponding to a block of number facts, using much the same system which has been described in the case of spelling. The facts most often used at the stage at which the children are at present working in arithmetic are used first and the several blocks are mastered in succession.

After the warming-up period, during which the pupils are getting into the swing of the practice, the teacher will note as she runs through a pack that certain individuals respond instantly to every card exposed. These children are released for the present. Others about whom she is not certain are given a period of individual practice, and, if successful, they in turn are released. And so on until the group under training is reduced to the problem cases, who are set aside for special study.

As the process of training goes on in this way, testing also goes on: testing of the pupil on automatic response; retesting the recall, apart from automatic response; and appraising the relative difficulty of individual fact items. A written test of automatic response is obviously impossible.

The training of children in this ultimate mastery of the number facts should not be thought of as a process antecedent to the reflective learning which arithmetic proper implies. (See chapter xiii.) Much as the teaching of correct spelling is a process of weaving correct spelling into the pupil's discourse, so the development of automatic response to number facts is a matter of

weaving such use into the reflective processes which the child uses in his assimilative experience in the mastery of arithmetical principles. Hence, the training is likely to continue from the beginning of the secondary period in arithmetic for a year or more. The situation is unlike that found in spelling in two important respects. In the first place, training in the latter is applied to an ever-growing active vocabulary, while training in the number facts is limited to a maximum field of 580 items. In the second place, the vocabulary becomes active only over a period of years, while most if not all the number facts are needed by the pupil as soon as the study of arithmetic begins.

V

OTHER USES.—While spelling and automatic response to number facts represent the chief use to be made of our second pure-practice subtype, there are numerous instances in which the principles of practice in one or the other of the subtypes can be usefully employed. In general, wherever training in rapid manipulation or automatic response is needed, this teaching type applies. Ordinarily this form of teaching is used only after some fundamental adaptation has been made in one of the other types. It is likely to be more serviceable in the field of special education, notably in vocational training, than in the field of general education. Typical instances are enumerated below.

1. Rapid and accurate footing of columns of figures, and other calculations, which are used frequently enough to justify special training. This process is of course subsequent to mastery of the fundamental arithmetical principles.

2. Developing speed and accuracy in typewriting.

3. Numerous specific processes in the field of practical arts where skill is to be built upon the foundation of a practical arts adaptation.

4. Certain cases in factoring, notably the forms $x^2 - y^2$, $x^2 \pm 2xy + y^2$, $ax^2 \pm bx + C$, which are of such frequent occurrence that it is sometimes worth while to develop a semi-automatic skill,

that is to say such familiarity that the characteristic situations are readily recognized and the manipulations rapidly performed.

5. Paradigms in foreign language after the reading adaptation has been formed, sometimes in a grammar course. (See chapter xxiv.) The training process here is strictly parallel to that for developing automatic response to number facts.

6. Rules and formulas. This field used to be greatly over-worked, so much so that a rule was often learned quite apart from the underlying adaptation. Of late years, perhaps the pendulum has swung too far in the opposite direction. It is sometimes true that a rule or a formula thoroughly memorized makes the difference between a learning which can be put to instant use and one which cannot. Probably the best illustration is the circle formulas, $c=2\pi r$ and $a=\pi r^2$. The adaptation here is a logical conviction that there is a necessary relation between the circumference and area of a circle and its radius. Perhaps it is essential that the student shall convince himself that as a matter of fact these relations are expressed by the formulas with which we are familiar. The use of this relationship, however, becomes almost as important in various studies of the secondary period as the multiplication table. Hence, it is a matter of economy to make the formulas a matter of automatic response and permanent retention.

PART IV
ADMINISTRATIVE TECHNIQUE

CHAPTER XXVII

THE INTEGRITY OF THE SCHOOL

AS we have developed our study of the teaching process, first as control technique and then as operative technique, we have also been dealing from point to point with another phase of teaching activity which has to do with the study of the individual pupil, with his guidance, and with the control of the progress of his educational development in its manifold aspects.

The school is a unit in its influence upon the pupil. Every experience which he has in the school tends to modify his attitude toward life. Such experiences may be organized and focused upon common objectives or they may be left to inhibit or counteract one another. Under the baneful influence of the factory stereotype, the school may be forgetful that it is dealing with organisms in the shape of human beings and act as if every pupil were a piece of plastic material capable of being wrapped up after each operation and of being found unchanged when it may be convenient to apply the next. The pupil is indeed plastic, but growth in many directions goes on whether the school operates or not. Unless the needful administrative procedure is properly conceived and adequately carried out, the educational product is purely in the hands of chance—it may be brilliant success and a normally adjusted personality or it may be wretched failure and a perverted, unhappy, and vicious personality.

In the hypothetical school consisting of Mark Hopkins and his pupil Garfield, or in the very real Drumtochty School under old Domsie, all these phases of technique coalesce in the personality of a great teacher. Unhappily, perhaps, society is long past that possibility. The school is organized and must be organized on the principle of division of labor, but there is all the difference

in the world between the school which is a sort of pedantic factory and one which is in some degree an expansion of Mark Hopkins or of the old humanist. In the one, the pupil encounters a series of more or less erudite lesson-hearers, periodically is fed into some testing machine, and occasionally, if he is very good or very bad, has an interview with a person who is classified as an administrative officer. In the other, the whole pupil goes to school to every teacher, to his personnel officer, and to the principal of the school or his assistant. Each of the latter in a school which is at all well organized to secure true educational products is wholly teacher or, if you prefer, educator. True, this person may be using history and another mathematics and a third physics as media of education, while a fourth is studying the pupil quite apart from any course, and a fifth is occupied with arranging a pupil's schedule or interviewing a teacher or parent. Nevertheless, to the extent that they are all teachers, and teachers in the same sense of the word, the school succeeds or fails in its principal mission.

It seems passing strange that anybody should feel it necessary to point out the principle. In point of fact, however, the tendency of schools to become organized upon that theory of the division of labor which is appropriate to the factory is so marked that when one speaks of administration in a group of school people the latter are apt to think of the duties of the principal or superintendent and not of those of the teacher. Conversely, when we speak of teaching, the administrator often thinks only of the testing of the results of those who work in the classroom. Students come to the university to prepare themselves for "administrative" positions. Courses which go to the root of the problem of teaching make small appeal to many such since they feel that they have escaped from teaching. Similarly, courses which are primarily administrative in character are seldom elected by those who are expecting to teach, albeit they will have every day, or should have, a number of administrative problems to meet. Now an administrative problem in the school means nothing ex-

cept as it is related to teaching; a teaching problem means nothing except as it is related to the growth of pupils. The fundamental profession is teaching. True, one may specialize in that aspect of teaching which is found in the preadolescent period, another in science- or language-teaching; another in the control of pupil conduct; another in case work; but all are practicing the fundamental art of teaching.

EXECUTIVE MANAGEMENT.—Administration is usually confounded with what is more properly called “executive management.” The school has relations with the community. It is probably intrusted with the application of some portion of the law of the land. There must be provided funds for its maintenance and systematic controls for the expenditure of such funds must be set up. There are various activities ancillary to the process of teaching, such as operation and maintenance of the school plant, which must be carried on. There must be some means of judging the qualifications of teachers and of employment and dismissal. Hence arises the requirement of executive management usually associated with the principalship or presidency or superintendency, and acting under a board of control which represents the body politic.

ORGANIZATION.—The actual functional relationship of the major activities concerned with administrative technique proper may be approximately depicted in the diagram which follows. It is of course true that in the small school the executive will also be the co-ordinating teacher and the personnel teacher and perhaps a classroom teacher as well. Or one or more classroom teachers may also be assigned to co-ordinating and personnel work. We are discussing functions and not persons.

The function of co-ordination of teaching implies, not only the intelligent and scientific arrangement of courses, schedules, and the like, but it implies a much more important function, namely, the recruiting, development, and often training of the teaching staff and the supervision of the teaching itself. In the small school, a single person may cover the whole field and unite

when he is absent, unless indeed the teacher is in the attitude of confidence characteristic of the pupil who is taking a valid educational test. The teacher who is concerned chiefly to please the supervisor is in the same impossible attitude as the pupil who is studying only for credits. The situation differs only when we encounter the remedial case. The person who either can not or will not teach ought not to expect to be continued in the charge of pupils while slow remedial measures calculated to make him or her an effective teacher are undertaken. But a corrective problem case in the teacher as well as in the pupil? Assuredly. Even the modern industrial enterprise no longer maintains a scrap heap for workmen who are at all possible. It does not pay.

Supervision implies first-hand fact-finding on the part of the supervisor. The most contemptible apology for supervisory incompetency is that form which may be characterized as "supervision by campus gossip," wherein the alleged supervisor forms his opinions of a teacher by listening to common rumor. It is incompetent because it cannot be founded on ascertained fact. It is contemptible because it leaves every teacher at the mercy of wilful and often malicious pupils or college students. It is in addition an acute form of professional malpractice, since it tends to exalt classroom demagoguery and the perversion of pupils in the place of competent teaching.

TEACHER-TRAINING.—It is a rare case, indeed, that the training of a young teacher can be dispensed with as soon as he has taken his degree in education and received his appointment to the teaching staff. The most that the school of education can do is to train him into the capacity of sound and effective methods of educational study, to put him in possession of the technology of his calling, to equip him with that body of knowledge and capable use thereof which makes him an educational scholar. His professional school should not perhaps grant its degree until it has good assurance that the candidate is adequately equipped with the academic matter which he proposes to use in teaching. His academic department ought not to grant a teach-

ing degree until it is assured that the candidate is pedagogically equipped to teach. But beyond that, he must be assimilated into the teaching force of which he has become a member, he must for a long time to come be trained in the practice of teaching, and, under ideal conditions, his supervisory officer should be capable of guiding him in his further professional and academic study until youth has hardened into the mature habit of taking it for granted that study is never ended. In the use of his academic material, the young teacher, especially at the high-school and junior-college level, will tend to be unwise in what he teaches, and he must learn wisdom at the hands of his own academic department. Just as the pupil's general education ends when he has arrived at educational self-dependence, so the period of training in service for the young teacher who holds both professional and academic degrees ends only when he arrives at pedagogical maturity and trustworthiness based upon conviction and not upon conformity.

The function of co-ordination necessarily includes the selection and nomination of the new members of the teaching staff. For the executive to intervene here, unless on very special occasions, is not unlike that supervision of study which consists in doing the pupil's work for him.

If the foregoing reasoning is sound, it follows that all members of the staff who are intrusted with the function of co-ordination and supervision should themselves be persons of undoubted educational scholarship, of the necessary academic scholarship, and of professional maturity. Obviously, they should further be capable of leading their fellows. So far as actually organizing and guiding a teaching force is concerned, well-nigh hopeless conditions are necessarily created when an essentially immature young man or woman is made responsible for the co-ordination of a school. Manners may be never so charming, personality never so winning, cleverness never so admirable; teachers can neither be trained nor guided nor stimulated by one who is not himself an educator and a tried-and-tested teacher.

PERSONNEL OFFICER.—In the organization of the modern school, the personnel officer has an extremely important place. True, every person who teaches at all is perforce concerned with the individual problems of his pupils. Nevertheless, there must be provided in some form teachers who specialize in the study of the personal problems of boys and girls just as others specialize in the use of mathematics or science or language as media of education. To the former come the personnel and problem reports and records referred to in the chapters which follow. In their hands is the working up of case studies and the assignment of remedial work. From the accumulation of evidence in their case folders is the decision touching the fundamental educational growth of the pupil and of ultimate educational maturity. In their hands is, or should be, the government of the pupil body itself and the protection of the school's morale. They carry on most of the interviews with parents when pupils have become general school problems rather than problems in specific subjects. Finally, they are the co-ordinating agency for the school's system of pupil advisers, and in their hands rests the final responsibility in the case of conduct cases.

STAFF.—In a large school, the personnel officer requires a considerable staff. Ideally, there should be an assistant personnel officer for perhaps every five hundred pupils beyond the first five hundred. There are further needed a competent teacher who has specialized in educational and psychological testing, and pupil case work, a medical inspector, and a teacher who has specialized in modern social case work. We reiterate the principles that all such staff specialists should fundamentally be teachers, that they should have the teacher's point of view, that they should have acquired what may be called "school sense" by actual experience in the classroom. The results of an intelligence test, a reading test, any educational test, when contemplated with eyes that have become accustomed to watching pupils in the learning situation, look very different from the same results when viewed simply as sets of raw scores, be the statistical analy-

sis never so skilful. The visiting teacher who is skilled in systematic social work may contribute valuable findings on conduct cases, but most conduct cases start life as learning cases, and half his professional world is closed to the eyes of the social case worker who is not also a skilful teacher possessed of a sense of teaching situations. The number of such staff specialists needed of course varies with the size of the school and still more with the character of the school's constituency. Up to an enrolment of five hundred at the most, in an average school constituency a single personnel teacher should be able, with the assistance of the school physician, to perform all the necessary testing and visiting and interviewing. It ought to be borne in mind that routine testing is distinctly a classroom teaching function and not a staff function.

GOVERNMENT.—The government of a school is not a military problem nor yet an old-fashioned police problem, though at times the pupil body may require a great deal of policing. Good order can doubtless be secured by anybody who is possessed of the necessary personal address, but not self-control and a sense of conduct values. Government, like all else connected with the school, is concerned with learning products. It is therefore a teaching problem. Every teacher in the school is a responsible factor in the government of the school or else he is not a teacher. The personnel officer with his organization is the appropriate co-ordinating force here, just as the supervisor of instruction is the co-ordinating force in that field, but co-ordination is his function and not direct action. The teacher who refers all his conduct problems to the personnel office is a weak teacher, and the school which is organized on such a basis simply ceases to be a school at all—it becomes merged in the personality of its personnel officer.

Government implies morale. With increasing enrolments and preoccupation with academic teaching, the tendency in large high schools and colleges is to try to devise some machinery of constraint which will operate automatically. It cannot be done.

A multitude of environmental influences operate upon the school—athletics, debates, a great many so-called extracurriculum activities, the home, the community, the press. There are no extracurriculum activities, for nothing which influences the tone and public opinion of the school is remote from its educational concern. Athletics or fraternities are as much matters of the curriculum as language or science. For the most part, these things are examples of the appreciation type of teaching and the personnel staff are the teachers. Every year we are treated to scandals which bring some school or college into entirely undesirable publicity. With rare exceptions, the causation lying back of the incident is a period, longer or shorter, of neglect of school morale or of operation under the delusion of automatic control. Either the school has become slack or else it has not been systematically organized to care for this major element in its life. In the end, publicity is deprecated because it “injures the good name of Alma Mater.” If Alma Mater had looked after her character, her reputation would have taken care of itself.

The mastery formula is as applicable to the government and morale of the school as to any of its classroom activities. The general policy of the school is the teaching. The behavior of the pupil body is the tested result. The personnel officer who approaches his task in a scientific spirit is ever observing, noting, checking up the evidences of group morale. He finds undesirable tendencies here and there. He follows them back to the causation which is at work. He modifies his policy to meet the situation.

It is probably no more true that strong personality is needed in the chief personnel officer than it is needed in every other teacher, but the consequences of employing a weak teacher here are more fatal and far reaching, and are apt to be more spectacular than in other cases. Too often a person is appointed who comes with academic credentials and, it may be, creditable attainments in the staff work required by the function, but not possessed of the strength of character requisite for the control and

guidance of a student body in which there may easily be several stronger personalities. The board of education thrusts its head in the sand and declares that all is well. The outcome is what we too often see: a school or college in fact committed to the guidance of a few strong students, immature and possessed not only of the normal self-assurance of youth but of a cockiness born of their sense of real superiority. The end result is a deplorable lowering of moral standards in the whole younger generation in the community. Far better close the doors of the institution than to trust its pupil guidance to a weak man or a weak woman.

As we have followed the teaching process through its various phases and types, we have discussed in each the features of administrative technique which are essential to the attainment of the learning products and the care of problem pupils. It remains to consider the principles which apply to the school as a whole and to all the types of teaching.

CHAPTER XXVIII

THE BASIS OF PUPIL ADMINISTRATION

HOW about "individual differences"? The question has been raised in the reader's mind again and again. In some measure we have tried to find the answer, as we have dealt with the several specific problems in teaching found in Part III and the more general problems dealt with earlier. Nevertheless, all pupils have to find themselves in the working organism which we call the school. We are confronted with the problem of homogeneous sections. Pupils have to be promoted in some sense of the word "promotion." They encounter difficulties in learning which seem to be inherent in the individuals themselves. In brief, the whole problem of intelligent administration centers about this issue of manifold individual differences in pupils. Such has been recognized to be the case throughout the whole modern period, and in general two contrasting theories of pupil administration have emerged. In both, the fact of individual differences is, as I think, uncritically accepted, with scant regard to the nature of the differences. The two theories may be characterized as the "individual method" theory and the "homogeneous group" theory.

CONTRASTING UNDERLYING THEORIES.—In the pedagogical literature of centuries, the issue of individual vs. group instruction has persistently been raised, and every now and then a new individual method is announced. Human beings learn as individuals, but they also learn best when individuals are in a social situation. Practical teachers, and others who are concerned, have long noted the stagnation and backwardness of the small one-room school in rural districts. More than that, they have commonly identified one of the patent reasons for the unhealthy conditions found: "Children have little chance to learn from

others." In brief, there is no adequate social stimulus and interchange.

The individualist school accepts the phenomena of pupil differences as being exclusive, unmodifiable and determinate, and arranges its procedure so that each pupil will proceed at his own rate and go as far as his assumed individual capacity determines. The more general social dearth of the small one-room school is not present, for after all there are many children in the school; but the specific social stimulus of working together in arithmetic or history or literature is likewise not present.

The fundamental fallacy of the individualist school, however, rests on the false assumption that individual differences in learning capacity are altogether or at least mainly inherent and characteristic. That such differences exist is beyond question. What they mean is another matter.

The contrasting theory accepts the group procedure, but for teaching purposes attempts to group together pupils of approximately equal learning rate, and, for programming the school career of pupils, falls back on the notion of differentiated curriculum. Both these expedients are, on our principles, ostensibly sound, but the administrative technique employed rests on a theory which is in essence a repudiation of the teaching function altogether. Whatever the cause of individual differences in rate of learning may be, it is assuredly *prima facie* a matter of economy to group together pupils of much the same learning rate. It is false reasoning, however, to assume that learning rate is necessarily fixed and inherent and that pupils can learn in no other way than in homogeneous groups. A differentiated program is likewise a sound interpretation of individual requirements, provided we have clear and valid analysis of the nature of individual handicaps and advantages, but when we differentiate pupil programs on the assumption of inherent and determinate limitations in learning capacity, characteristic of the individual pupil as such, we practically repudiate education itself.

We challenge the common essential foundation of both theories, holding that it rests on a superficial and misleading analysis of individual capacity.

I

LEARNING CAPACITY—PHYSICAL BASIS.—Learning capacity is only another name for individual adaptability. Let us bear in mind just what we are thinking about. We are not concerned with the individual's adult achievements in life, with what he does with his learning. We are not concerned with physical characteristics which have nothing to do with learning capacity; nor with likes and dislikes which are the results of learning; nor with any circumstances which are more or less influential in determining what the individual *will* learn rather than what he *can* learn.

Given life as we know it, learning capacity is based on a physical adaptive organism which is a characteristic of the child as a human being and in large measure characteristic of him as an individual human being. The organism is an exceedingly complex affair, consisting not only of brain, central nervous system and neural end organs, but also of an autonomic nervous system, a glandular structure, musculature, nutritional system, and indeed pretty much the whole physical body. The more physiologists and neurologists have to tell us, the more modest we become touching our assurance as to just what the physical basis of a given act of learning is. Nevertheless, we do know, as well as we know anything, that we must think of learning capacity as having its primary foundation in the physical adaptive system.

We know, for instance, that defective vision must of necessity handicap an individual in certain kinds of learning. And so with defective hearing and speech, crippled muscles and other conditions which are patent to ordinary observation. Scientific investigation goes much farther, and discloses similar handicaps, or even fatal obstacles to learning, in inferior or unhealthy qualities of structure and function. Such handicaps or obstacles may be the result of inherited characteristics, or of disease, or of injury. They may be permanent and ineradicable. They may be

remediable. They may be temporary. Most of them are temporary, for most of us have almost daily experience with some of them—the consequences of indigestion and fatigue for instance.

ORGANIC DRIVES.—A feature of the physical adaptive system is a body of urges which come into the world with us and which are characteristic of us as human beings. We have them for the simple reason that individuals in our ancestral background survived and had progeny because of them. There are many of them, but in general they center about self-preservation and the preservation of the race. It is worth while to note in this connection that we have little or no inheritance in *adjustments proper* as do the lower animals, such as nest-building and migration in the birds.

Now these instinctive urges are apparently inherited in all degrees by different individuals. They are more or less subject to sublimation, as we have seen in our study of learning in appreciation. They are subject to hypertrophy or excessive development and to perversion or abnormal development.

TEMPERAMENT.—A similar type of urge appears in the individual in what we call temperament, which is apparently altogether physical in its basis, for the most part innate, and to a large degree inherited in the family as distinguished from the racial line. Like the racial urges, temperamental proclivities are subject to modification by learning under the sublimation process.

SUBNORMALITY.—In recent years, we have been greatly interested in individuals who cannot learn, or at least show rather definite limits to the extent of their adaptability. These people we call mental defectives, and very extensive studies have left little room for doubt that their condition has a physical foundation in either a congenitally inadequate adaptive system or else in injuries which the adaptive system has suffered from disease or mechanical accident.

Now all the evidence available points clearly to the principle that these unfortunates are instances of definite pathology and

not merely one end of a series which is continuous from idiocy to genius so-called. In the first place, the geneticists are clear that mental defect in many cases, and perhaps in most cases, is traceable to inheritance in the family line. The defect seems to behave as a unit character, a Mendelian recessive. In the second place, cases which are not genetic in type are for the most part definitely traceable to the destructive effects of diseases like infantile paralysis, scarlet fever, and the like, or else to pre-natal or post-natal injuries.

Hence we choose the term subnormality to mark off these people as being less than normal in their learning capacity, and we imply that a normal child, however dull he may seem to the teacher and however low his I.Q. may be, is nevertheless capable of learning if we know how to teach him. Furthermore, subnormality must be identified on positive evidential grounds, and not from inferences drawn from behavioristic indices like I.Q. scores in which thus far the physical and educational bases of learning capacity are hopelessly confused. A mental defective may well show a consistent I.Q. of 50, but the I.Q. is low because he is defective; he is not defective because of the low I.Q.

TALENT.—We encounter children in school who exhibit quite unusual learning capacity, particularly in certain directions. It is hard to untangle such a situation in the case of a school child, especially if he has the development of a pupil in the secondary school, and separate the elements which are physical in origin from those which have been learned. Nevertheless, we can see plainly that there are certain purely physical characteristics which make some learnings especially easy with some children. For instance, unusually acute vision or hearing sometimes gives advantages which may appear as talent. The peculiar oral cavity of the accomplished singer makes possible a kind of learning which an individual not so endowed could hardly achieve. And so with many other specific characteristics. Whether or not the creative genius was "born that way," we simply do not know. Wherever the attempt has been made to settle the matter through

investigation of the adaptive system itself, there has been about as much evidence on one side as upon the other.

HEREDITY.—Now the whole issue of the extent to which a child's learning capacity is inherited in the biological sense of the word, hangs on the determinative character of the adaptive system. Parents can transmit physical characteristics. They cannot transmit personal characteristics any more truly than the child's teachers can transmit them. In fact, they do transmit both kinds, the one in the germ plasm and the other in their parental teaching. The innumerable attempts from Francis Galton down to prove the determinative character of biological inheritance by appeals to the history of royal and noble families and families of distinguished men have one and all broken down on this issue of the two kinds of inheritance. Every fact cited is as easily explainable on the theory of family tradition and teaching as on the theory of biological inheritance. In the famous Jukes-Edwards case, we do know that the Jukes' biological inheritance was bad and we know why and wherein. We do not know wherein the Edwards' biological inheritance was good, but we do know how personality transmission might have and indeed must have taken place.

CAN AND WILL.—What then can we make out of all this touching the influence of the physical foundation of learning in the process of general education?

In the first place, it is clear that the possibility of learning at all resides in the normal adaptive system. Further, injury to and malady in the adaptive system handicap the learner. Finally, we can hardly escape the conclusion that differences in the physical excellence of different individuals make corresponding differences in the readiness and rate at which the individuals develop through learning and therefore, *other things being equal*, the extent to which development is likely to go in a given available period. Does this mean then that the physical structure is exclusively *determinative* of either rate or extent of development? Save in the cases of subnormals and certain specific physical

handicaps, we know that it is not thus determinative, that physical advantages may be and customarily are far more than offset by other considerations with which we shall presently deal. No tests, which have thus far been worked out, can assuredly grade the physical learning capacity of an individual, the only native capacity he has, for such tests would of necessity have to be instruments for measuring functions in the terms and with the methods which bio-chemistry employs, or else tests capable of measuring mental functions as such apart from the influence of learning. Granted such a measuring stick, the values derived would not be measures of learning capacity, but only of one aspect of learning capacity.

We have noted the influence of varying intensities of instinctive and temperamental drives or urges which are themselves physical in origin. Here we are concerned with factors which are more or less influential in determining what direction learning is likely to take, rather than either the possibility of learning or the readiness with which learning takes place. They are likely, for instance, to make it easy for some interests and tastes to develop as compared with others.

We may perhaps refer to that aspect of learning capacity which is physical in its nature as *organic*, and to the contrasting aspect as *personal*, that is to say, based on evolution of personality under the process of education.

II

LEARNING CAPACITY—PERSONAL BASIS.—It is altogether probable that in the lower animals learning capacity is strictly proportional to the excellence of the adaptive system as a physical mechanism, in either the species or the individual. Indeed, until we reach the higher mammals, there is little or no learning at all, for adjustments are inherited rather than learned. The innumerable instances of individual adaptive responses which we find, even in the vegetable world, are not instances of learning as we use the term in education, albeit they are doubtless

primitive instances of the same characteristic in protoplasm which in man appears as the physical basis of learning which contributes to education.

As soon, however, as a creature appeared in the course of evolution which possessed an organism capable of language and the use of tools, the excellence of the organism itself ceased to be of major importance. Learning could now breed learning: in other words, true personality appeared in the universe. Recent studies have shown that not even the highest apes, despite ingenuity which at times seems human in its characteristics, have anything even resembling personality. Their adaptive responses in particular situations have in them nothing of the quality of social institutions which can be preserved and handed on to others as coherent systems of attack on the world. Human paleontology finds little reason for thinking that man is physically any better than he was perhaps fifty thousand years ago. Civilized man is in personality so utterly different from his physical ancestors that he holds a unique place in creation. In brief, human progress has been characteristically improvement in personality, and hence in civilization, and not physical improvement.

Every teacher who has worked in the primary school has had in her experience incontestable evidence of the principle. Whenever she has seen a child learn to read, learn to express himself in writing, learn to use the number system, she has seen him gain possession of means of access to learning, and personal development, which lift him in a few months over the immense gap which lies between him and the stone age. We commonly say that the child has learned to read, write, use numbers. It would be better to say that he has become a reading, writing, and cyphering person. He has acquired capacity for learning, even though he is rather dull, which places him at immense advantage *in learning capacity* over his superlatively bright contemporary who has not acquired these fundamental arts of civilization. Teachers who see pupils take on the conduct attitudes of civilized life, see them acquire tastes which lead them into profitable reading, see them

learn to think about the world in scientific terms, also see them make immense gains in learning capacity. A pupil who is inherently bright, as many are, may have gained all this learning more readily than his slow and plodding companion; but the learning once gained, the differences between them, in capacity for further learning, which are due to differences in inherent capacity, are small, compared with the total learning capacity which each has. In other words, from the beginning of the primary school onward, learning capacity comes to depend more and more on what has been learned, and less and less, relatively, on organic capacity, provided the latter is not tainted with definite pathological qualities.

SPECIFIC FACTORS.—How does it happen then that we find greater and greater differences in learning capacity as the school career of a class is prolonged, until one after another the slow ones drop out and still the differences appear? Of the reality of such conditions in school, there can be no doubt. I think we can enumerate most of the factors in the situation with considerable confidence.

1. There is likely to be a small number of pupils who are definitely defective in organic learning capacity. Of late years, these are usually segregated and far too often others who are in no sense defectives are segregated with them. So easy is it to infer that a pupil whom we find it difficult to teach must be "dumb."

2. We carry along in school several children in nearly every class who are afflicted with remediable but unremedied organic handicaps.

The foregoing are of course organic factors. Much more important because they are much more numerous and critical are personality defects.

3. Apparently the most common of the personality defects is inadequate or segmental or perverted apperceptive mass. The pupil is empty-headed, or one-sided, or wrong-headed. The experiential and ideational background which contains the material out of which learning emerges, but which is not in itself

learning, is such that the new material presented by the school finds no point of contact. The pupil does not learn, simply because he is too ignorant to learn.

We have noted the importance of this condition in nearly every chapter, and have pointed out the methods of so organizing the school system that it may be corrected for most pupils, and in principle for all pupils. It is perhaps worth reiterating, however, that when immense bodies of people suddenly rise from traditions of poverty and utter meagerness in the content of life into economic competency and independence, the school even in the most favorable circumstances will require more than one generation in some families to root out this fundamental handicap. It is however a question of enriching home life in successive generations and not a question of biological transmission.

4. Next in importance, if not of equal importance, is conduct retardation, infantilism. In our study of the conduct attitudes, we have seen how each of them in one way or another contributes to learning capacity. This is especially true of those which have a strong volitional element. In these cases, the pupil does not learn because he will not learn.

In other cases, retardation means that the pupil is inhibited from responding to the social requirements of learning in a class group. In others still, infantilism results in building up personality deviations of an emotional type. The pupil becomes a "queer stick" if not an out-and-out psychopath.

5. Many non-learners or slow learners, especially from about the fifth grade up, have been found to be such because of defective primary learnings in the fundamental school arts. As early adolescents, many of them compensate through conduct perversions. It has been noted that juvenile-court cases show an interesting predominance of individuals who began to go wrong in the fourth grade, the reason being that non-promotions probably began to occur at that point on account of failure in the reading adaptation.

6. Many of our cases are traceable to non-mastery promotions and to unwarranted double promotions. These pupils become more and more defective in learning capacity through sheer lack of essential previous learnings. In schools which appraise progress on lesson-performance, they tend to go unnoticed until a situation is met in which they are perforce thrown on their own resources.

7. Occasionally a case is found in which there seems to be no explanation other than the failure of any genuine interest whatever to arise.¹

Now these five outstanding classes of defects in learning capacity, which are personal rather than organic in nature, by no means exhaust the list. In anything so exceedingly complex as personality there are innumerable opportunities for a screw to get loose in unexpected places, some of which can be found through ingenious study and some of which are beyond our present knowledge. Nevertheless, the disclosures of pedagogical case study and of competent psychiatric analysis are to the effect that in its gross aspects personality is a much simpler affair than has commonly been supposed. After all, most of us are rather tough citizens and will stand a surprising amount of rough handling, provided the basal structure of personality is sound.

To assert that personal learning capacity is within the complete practical control of the school would be to claim perfection for the school. Nevertheless, there is an immense difference in effect between the theory which asserts that learning capacity is mainly organic and therefore beyond pedagogical control and the disclosures which make plain that in the normal child under civilization the personal element in capacity is potentially far more determinative than the organic element. The former necessarily repudiates the teaching function and leads us to believe that a school properly consists of a sort of steward in the principal's office, nurses in the classrooms, and a testing room as the essential function. The latter makes teaching the center of

¹ See chap. vii, p. 109.

effort and recognizes untold possibilities as the outcome of systematic teaching, however ignorant we may as yet be and however far short in practical achievement.

III

CHANCE AND SYSTEM.—All the foregoing doubtless raises in the reader's mind the ancient debate "*heredity vs. environment*" or its modern form "*nature vs. nurture.*" The debate has about as much meaning as its fellow, "Has fire or water been of the greater benefit to mankind?"

And at the time of this writing, there seems to be a distinct retreat of biological and psychological investigators from the extreme position which held that organic capacity is altogether or mainly the determining factor. Most such students, however, seem still to hold that after all each of us has an inherent capacity which fixes his personal development beyond any possible effect of environmental influence. All this may freely be granted on the principles set forth in the present chapter, and still the demurrer may properly be entered that the essential and critical point is ignored.

The method of practically all such studies is statistical. In general, children who presumably have a common organic capacity and who have been subjected to contrasting environmental influences are studied in terms of some index of capacity, usually an intelligence test. We may well challenge the validity of studies which select the subjects on the basis of I.Q., for, as we have seen, it is far from being shown that any intelligence test thus far devised does measure organic capacity. However, in the studies which select identical twins for comparison we may at least feel sure that the investigators were dealing with the same genetic material. Even in these exceptionally careful studies, organic characteristics other than biological inheritance are prone to be ignored. However, for the sake of argument, let us accept all such studies as being valid in method so far as they go. The most important issue lies beyond.

As we have noted, the method of investigation is prevailingly, although not altogether, statistical. Enough cases are collected to show the trend as is the practice in life-insurance procedure. It is then inferred that the statistical trend determines the principle, regardless of exceptions. Not so. If we find a number of cases, large enough to satisfy competent statistical analysis, in which the influence of environment is found to have a certain value, the inference is rightly drawn that similar results will be found, however large the number of cases may be. It does not follow that therefore environmental influence is in principle as important as the disclosures indicate and no more. Exceptions occur and these exceptions cannot be washed out by majority vote.² One case in which it is clearly shown that environmental influence is the determining factor *and why* would outweigh a thousand in which it is not shown, for one such case is positive and proves that environmental experience may be the determining factor and the thousand cases do not prove that it cannot be.

Nevertheless, the disclosures of the statistical comparisons are much as we should expect them to be in view of our analysis of the relations of the organic and the personal elements in learning capacity. The studies are focused on the modifications which environmental influences can make in native capacity as measured by some form of intelligence test. In order to do so, as we have seen, children are studied under contrasting or at least different surroundings, typically those of different family groups. Sometimes they are studied under the influence of different teachers or schools. In most if not all such cases, the chief influence which the more favored family or school could have contributed must have been some slight advantage in apperceptive mass and perhaps in conduct, but in every case casual and unsystematic rather than analytic and positive influence. Hence, the situation is much like that in which uncivilized man finds himself—organic capacity is the dominant influence because the other factor is not sys-

² Bagley in *Determinism in Education* has collected the literature which exhibits such exceptions.

tematic. If the favored families, or other environmental groups, had made competent case studies of their children and set about the task of systematically building up civilized personalities, the contrast between the influence of organic capacity and the influence of systematic teaching would probably have been very different from the contrast between the influence of native capacity and that of chance environmental surroundings.

The latter sort of comparison is exactly what we secure through case work and remedial treatment, provided our problem case is as a matter of fact not subnormal. Very generally we find that non-learning is caused by failure of the personality to develop under the learning process in the arts and sanctions and insights of civilized existence.^a

IV

INTELLIGENCE TESTS.—This prolonged consideration in which we have made some attempt to get at the bottom of the question of learning capacity gives us some basis for an understanding of the nature and limitations of intelligence tests, at least of those commonly used in schools. And this problem is veritably at the heart of our theory of pupil administration.

The period in which it was believed that these tests were valid measures of organic capacity has now largely passed by, and with it the underlying assumption that learning capacity is strictly a matter of organic capacity. Are the tests then of no value at all?

Properly understood and properly used, they are a most valuable instrument in pupil administration, so much so that we may express the hope that they may in the end be refined and greatly extended. In effect, they are essentially excellent comprehensive examinations, better than such examinations commonly are for the reason that they are standardized and thus more or less universalized.

^a The most comprehensive summary of studies in the nature-nurture controversy can be found in the 27th Yearbook of the Society for the Scientific Study of Education.

The best of them give us a very inadequate measure of personality at any one time, for they necessarily ignore conduct and appreciation elements in general. But they do give us a very useful bird's-eye view of ideational content and to some extent of the establishment of school learnings, especially if we ignore test scores, mental age, and intelligence quotient as mathematical notions. In the preliminary investigation of any pupil, whether he is a problem case or not, rapid scrutiny of the content of his intelligence-test paper and common-sense observation of his behavior during the testing period give us a very fair picture of his probable intellectual content and organization. They tell us wherein he is likely to prove weak and wherein he can probably be accepted, and they very likely suggest to us something of his temperament and emotional condition. They give us our initial clues and enlighten us somewhat to the direction of further inquiries.

PROGNOSTIC VALUE.—The prognostic value, however, especially in the secondary period, is apt to be misleading, despite the high correlation which has again and again been found between intelligence test scores and the subsequent school history as revealed by marks and grades as well as by standardized performance tests.

If you are clever enough to devise empirically a series of questions such that the scores attained thereon match the performance grades attained in school, then doubtless the correlations will be very satisfactory so long as you keep on doing as you always have done. If you further reason that a pupil who is doing poorly in school must of necessity be of poor inherent capacity, then your highly correlated tests may inferentially be held to be measures of native capacity; but the reasoning itself is bad enough to make all the logicians turn in their graves.

On the other hand, if you dismiss prior assumptions as to the significance of school attainments altogether, as the best of the more recent tests do, and ask questions of the "everybody-is-supposed-to-know-it" variety, you will get some sort of a yardstick for apperceptive mass and your scores will therefore be

prognostic and understandably so. Experience with such tests is likely to disclose that correspondence with school learning is much better for pupils who fall in the highest and the lowest quintiles than for the others, and this is understandable too. Those who fall in the highest quintile are likely to possess ideational backgrounds which are according to the expectations of the school program, and those who fall in the opposite end of the distribution are likely to be those who are too ignorant to learn at all, at the level contemplated.

The prognostic use of tests is, however, prone to be misleading, and even disastrously so, for two reasons.

In the first place, it has a strong tendency to lead administrative officers and classroom teachers alike to attempt to fit the pupil to the school rather than to fit the school to the pupil, and little by little the school thus comes to be mistaken for education in the place of being viewed as an instrument of education. When a pupil is sent back from the administration of the intelligence test with the verdict "Dull normal; will not go far," the educational question is begged altogether. In that case, the testing was either a meaningless gesture, or else the pupil's program will be likely to be arranged so that he cannot go far.

In the second place, whatever the administration may understand to be the nature and limitations of the testing, the pupil is prone to think that the results place him in the scheme of things as being good, bad, or indifferent clay and inescapably so. Of course his attitude is confirmed if the teachers think so too. Now, if such a view were beyond all question the right one, then we should have to learn how to make the best of it; but, as we have abundantly seen, that view is not the right one. Even if there were a great deal better evidence for it than there is, it would still require a great deal of proving. Scientists and practicing school people alike have colossal assurance when they assume to classify the lives of human beings beyond recall.

Especially in the adolescent period, a great many pupils begin to be concerned about their place in the world and increasingly so

as the period goes on. Marriage, livelihood, and place in public esteem are all of them critical issues and the occasion of infinite anxiety. Hence shyness, boasting, bizarre clothing, the solemnities of initiations, youthful cynicism, "collegiate" ways—all of them defensive behavior, over-compensations, attempts to "put one's self across," or else failure in compensation. In this period, once convince the youth that he is inferior beyond recall and disaster indeed ensues. The result may be merely chronic unhappiness, but it also may be serious personality disorder. In the case of vigorous physical capacity and a forthputting temperament, the youth may compensate by squaring the injustice through criminal activity. On the other hand, conviction of innate and indefeasible superiority, or even conviction that there is such a thing in the world, may and in fact sometimes does result in an utterly perverted attitude in which the individual views himself as being above all social restraint even to the extent of taking life.

Indeed, the misuse of intelligence tests as prognostic instruments is fraught with the possibility of such miserable injustice and injury to individuals that the school ought to dispense with them altogether unless it can learn to use them rightly.

V

USE IN SECTIONING.—The question is often proposed, Is the use of intelligence tests as a basis for sectioning classes in the interest of homogeneous grouping defensible? In the light of our analysis, perhaps we can find some reasonable answer.

In so far as certain types of intelligence tests are essentially rough but valid measures of apperceptive mass, they may prove useful as contributing some of the data upon which sectioning in science-type classes is done, but only providing the content of the pupil's papers is analyzed. Such analysis for instance may show that a given pupil is in all probability relatively very good in the language elements of his present intellectual structure and relatively poor in the mathematical elements. In such a case, it is

evidently absurd to place a pupil in a moderately fast section in mathematics because his total score is fairly good.

On the other hand, if the pupil is in one of the lowest quintiles on one of the more recent types of tests, the question may well be raised whether he would best be assigned to a course at all. Further exploratory study in the specific field should settle the question.

Finally, scores on general intelligence tests are no sound positive basis for sectioning in literature, the fine arts, language; for they commonly do not contain test items from which sufficient evidence can be drawn. Apparent success in achieving homogeneous sections in this way is commonly traceable to failure to analyze the teaching procedure itself as valid. In other words, when such tests do give good sections in literature or language it is always possible that classes are being conducted on science-type principles. On the other hand, deficiency in ideational background is of course very likely to imply that the general background of tastes and conduct is also poor, since the meagerness of experience which would account for one is likely to involve the other as well.

VI

RAPID PROMOTION.—Even the very bright pupil must learn, whatever the origin of his brightness, whether organic or personal. In the recent period of preoccupation with “mental ability,” confusion of learning capacity with learning or adjustment not infrequently leads the school to reward capacity to learn rather than learning itself.

The graded-school stereotype in pedagogical thinking lends itself with a singular facility to this fallacy. The curriculum is apportioned to the successive grades and similar subdivisions of the school career. In itself, this is a convenient and suitable administrative arrangement, provided the administrative arrangement does not become an end in itself. But now comes the rage for testing mental ability and determining mental age, again in its own place and properly used an invaluable addition to the teacher's cabinet of professional tools. The fatal thing about the whole

arrangement is that grade levels can so easily be transmuted into chronological age, and this in turn compared with mental age. What more natural than to fit mental age to the normal age-grade level? If the seventh-grade chronological age is normally twelve and John has a mental age of twelve, obviously the sensible thing to do with all convenient speed is to shift John to the seventh grade, even though his chronological age is but ten and he is in the fifth grade. And the results seem to justify the procedure; John does well in the seventh grade and very possibly he has taken on a new interest in school. If capacity and performance are the only terms in our administrative thinking, all conditions are satisfied. Unhappily, however, the boy has either lost all that he should have learned in Grades V and VI, or else, what is more likely, he has only half-learned in the rapid process of translating him from the fifth grade to the seventh. Mastery of the true learning products is a slow process of growth, not the factory process which the administrative procedure described really implies.

It is true that the situation in which we found John required attention. Critical observation of the case no doubt revealed the true learning situation and the findings thereof were doubtless verified by the results of the intelligence test. The appropriate administrative procedure, however, was quite different, and to this point we shall return in the next chapter. Meantime, suffice it to remind the reader that the pupil must acquire the learnings implied by the fifth and sixth grades if we would avoid maladjustment later on.

VII

MATURITY AND ADJUSTMENT.—The pupil who is a rapid learner, be the cause what it may, is undoubtedly harmed if he is inhibited from learning up to what is his normal rate. The inference, as we have seen, is apt to be that he should move through the graded system at a more rapid rate. In certain cases this may be the correct inference, while in others it is a false inference. Learning, as the term is here used, means intellectual adjustment, but there are clearly other forms of adjustment. One of

the most important is adjustment in conduct. Young people sometimes exhibit more rapid intellectual than social development. That is what we mean when we speak of a pupil as being bright, a rapid learner, possessed of notably advanced intellectual growth, but somewhat of a baby still. We are apt to note that he associates with younger children, or perhaps withdraws from any association at all. At home he is still "mother's boy." Sometimes a corollary is slow physical development; or it may be that his social maturing is normal for his age and that he is intellectually precocious. In either event, the sound procedure appears to be, not advancement to the standing of his intellectual peers among the older pupils, but an expanded curriculum on the principles explained in the next chapter and continued association with children of his own social age. Growth in the fundamental social adjustments arises out of contacts with contemporaries and not out of classroom study.

On the other hand, certain individuals exhibit accelerated social, and, it may be, a correlated physical development. In such cases, movement upward to levels in which the pupil finds his social contemporaries is of course indicated. These socially precocious children impose a great deal of concern upon the administrative technician, to the end that volitional and intellectual growth shall keep pace with social development. Forcing is not justified, but a great deal of hard work on the pupils' part is justified. Fortunately, such pupils can usually bear a lot of hard work.

The same principle appears, with added force, in the case of the pupil who becomes intellectually retarded to the extent that his classroom work has to be carried out in company with much younger children. The consequences in the developing personality are unhappy indeed. The moment it becomes clear that a pupil is likely to be outstripped in the learning process by his contemporaries, intensive pupil study and intensive corrective or remedial work are called for. Thus it becomes evident that adjustment rather than learning capacity is the sound basis of sectioning, and the case history rather than the intelligence test its most reliable instrument.

CHAPTER XXIX

CONTROL OF PUPIL PROGRESS

IN nearly every chapter in Parts I, II, and III we have discussed the principles according to which pupils must move forward in the school career. We have set forth the administrative stereotypes which have arisen out of the historical evolution of the fundamental schools and have shown how for the most part they do not furnish an adequate basis for the control and direction of sound educational growth. We have considered the educational implications of such administrative procedures as evaluations of progress in terms of lessons learned and of educational determinism arising from wrong interpretations of the facts of individual differences. We have traced from chapter to chapter of Part III the administrative implications of mastery of the units of learning. It remains to bring all the foregoing together in a system of administrative technique calculated to appraise correctly and control and guide the process of adjustment as it must be furthered in the school.

I

UNIT ORGANIZATION.—From the time at which the child enters the period of study which we call the secondary school to the end of that period and thus to the end of the period of general education, his progress consists in making certain adjustments to the world in which he finds himself, in learning how to make such adjustments—which we call “learning how to study”—and in acquiring the tools with the aid of which other adjustments can indefinitely be made. From step to step, such adjustment is made up of adaptations which we have called “unit learning products.” What are the fields of learning through which adjustment to environment takes place, it is the province of the curriculum-

maker to say. Whatever the fields may be, each is made up of essential unit learnings which carry out the process of adjustment and which it is the province of scientific teaching to identify.

The mastery of each such unit is the point of departure in the administrative control of pupil progress. The units differ in extent, and they differ in their nature as we pass from type to type of teaching. In some subjects, of which the sciences are the best example, there will be many units in each list. In others, notably the language arts, there will commonly be but one fundamental unit in the list, with perhaps several accessory skills.

Each such list of units, whether one or many, of necessity constitutes a course, but a given course has no necessary relation to a school year or part of year or other period of time-to-be-spent. The time required may be less for some sections and in some years and more for other sections and in other years. The time required for some courses is in its nature less than that required for others. We have not the space to study the nature of different courses by enumerating all which may probably be given in the secondary period; a few illustrations must suffice.

If we reduce the number of units in arithmetic to the absolute minimum requisite for the adjustments required by general education, we shall find that not one year but several are required for the completion of the course. But some sections will complete the course in full earlier than others. It is absurd to speak of "fifth-grade arithmetic," for, if the course is at all well administered, the same units will not appear in the fifth year for any two sections, nor for any two years for the corresponding sections, in the same school. There are not three courses in arithmetic, much less six or eight, corresponding to the numbered years of school life in which arithmetic is found, but a single course. The pupil is not "promoted in arithmetic" from grade to grade; rather, when he exhibits mastery of a unit, he undertakes the next unit.

In the case of English grammar, on the other hand, mastery of the essential learnings can ordinarily be achieved in less than a

year—in some sections in considerably less. When the course is completed, it is dropped whether that goal be reached in June or in the previous February. Nor does this or any other course necessarily begin in September or in February; it begins in principle whenever there is a section ready for it.

The same general reasoning applies to other subjects in the science type. A qualification is, however, to be noted. In the physical and biological sciences, and to some extent in others, there are two different kinds of adjustment required by general education without going over into the field of specialized training. These are: (1) the use of the science for generating intelligent attitude which works out into intelligent behavior, and (2) the use of the science as a systematic method of thinking. We have dealt with the distinctions in our chapters on operative technique. We reiterate the principle here as a reminder of its administrative implications.

In the appreciation type, a succession of courses is not of the upper- and lower-level type nor is the apperceptive sequence so vital. We have already seen the administrative relation of courses in that type in our chapter on the teaching of literature (see chapter xix).

In language arts, French for instance, we have to do with courses which, although they belong to the same general field of knowledge, are pedagogically so unlike that they belong to entirely different types of teaching. The first course is of necessity always a course the objective of which is the reading adaptation. The course has no relation to school years. As in the case of arithmetic, some sections may reach the objective soon and others late. It is pedagogically meaningless to speak of French I as a course which falls in the first school year of a sequence of years. French I, defined as the course, longer or shorter, in which the pupil reaches a given learning objective, has definite pedagogical meaning. A course in French grammar has all the administrative characteristics of the course in English grammar. It is probably placed later in the pupil's school career, not because there is any

special appropriateness in assigning it to the high school, but because in the circumstances of learning the pupil ordinarily has no need for it until he has reached the higher level.

II

SEQUENCE OF COURSES.—The notion that knowledge can be translated into education and the corresponding notion that the school career of the pupil is essentially a matter of ground to be

THE SCIENCE-TYPE SEQUENCE

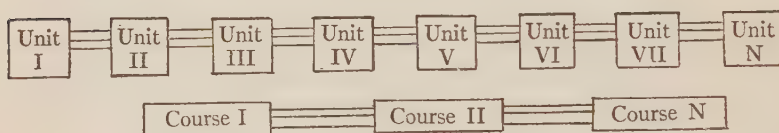


FIG. 9

covered have tended to assign a peculiar and indiscriminating sanctity to sequence in courses. Conversely, the widespread confounding of learning with learning capacity has tended to set up an equally indiscriminating laxity in the opposite direction. In truth, severe adherence to sequence is essential in some types and

THE PRACTICAL-ARTS SEQUENCE

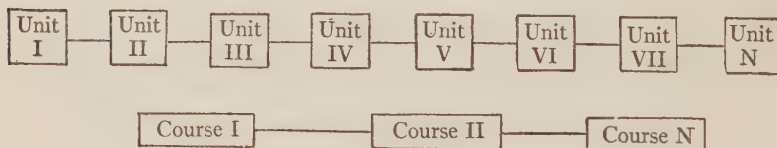


FIG. 10

not in others. Figures 9-11 perhaps give us a basis for a clear understanding of the principles which seem to be in control. The importance of sequence is indicated by the number of lines connecting the figures which stand for units or courses. Three lines indicate that a sequential relation between courses in the same general subject is imperative. A single line indicates that it is de-

sirable but not imperative. No line at all indicates that a strict sequential relation has no meaning.

In science-type subjects, the nature of the learning is ordinarily in strict apperceptive sequence. The ideas derived from learning how to manipulate the process of addition, for instance, are essential to learning how to manipulate the process in multiplication. This is an illustration of unit sequence. Similarly, one would scarcely attempt to teach a course in algebra prior to a course in arithmetic. If we offer both general science and physics

THE APPRECIATION-TYPE SEQUENCE



FIG. 11

or chemistry, neither of the latter would be placed before the first course named. If we offer both "The Survey of Civilization" and "Modern History," we should expect the pupil to acquire the former of the two first. The unit sequence in other courses of the science type is less imperative than it is in mathematics, but still there is, in the nature of things, some sequence which will make learning most economical. In both unit sequence and course sequence, therefore, the pupil must follow the line. Otherwise, orderly accumulation of ideas will be prevented and mastery of later units will be rendered difficult if not impossible.

In the practical-arts subjects, units are sometimes in necessary sequence but ordinarily not. It is a matter of indifference, for instance, whether cooking be taught first or sewing, at least as far as apperceptive relations are concerned.

In the appreciation type, as exemplified by literature, there is no necessary sequence whatsoever, except that general apperceptive mass established in an abundance of free reading is of course essential to all courses. General experiential maturity may make it desirable to postpone the essay until late in the pupil's career, and we think there are distinct educational rather than pedagog-

ical advantages in introducing the drama at an early stage; but there is nothing in the drama which is prerequisite to the appreciation of the novel and nothing in epic or lyric poetry which is indispensable to a proper reading of the essay. On the other hand, there is nothing in the nature of mental age in the pupil which makes it desirable that he should hurry over the drama and skip the novel in order to undertake the poetry units.

When we turn to the language arts, quite a different situation arises. Here, ability becomes much more an important consideration and sequence in learning within the course less important.

LANGUAGE-ARTS AND PURE-PRACTICE SUBTYPE A

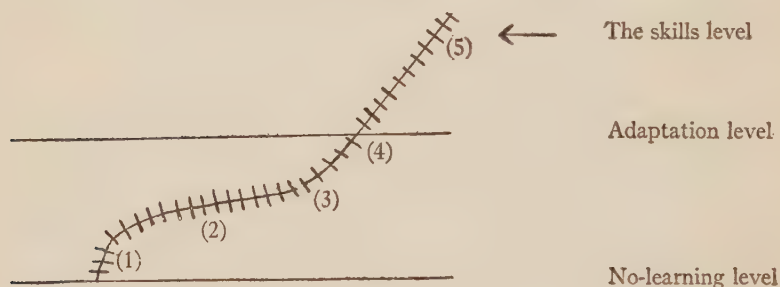


FIG. 12

In the diagram (Fig. 12), the line which intersects the two horizontals represents the learning curve. Now learning here consists in acquiring a special ability. It is true that at some point the pupil attains the adaptation, that is, he has learned to read or to write, but meantime he does not need to pass through successive units of learning in detail as he must in science-type learning. If we think of the crosses on the learning curve in the diagram as standing for graded exercise material, it is not essential that a given pupil shall cover all the bits of exercise material in sequence. A rapid learner may proceed continuously up to position (1) and then skip to position (2), as far as the exercise material is concerned, continue in sequence of material available to position (3), and then skip to position (4). Very soon thereafter

he will reach the adaptation and the objective of this particular course. Sections may possibly be organized for practice and the acquisition of skill beyond the adaptation. In that case, our bright pupil may again skip to the exercise material represented by position (5). The only control necessary is found in the single test: Can the pupil manage the more difficult exercise material and learn from it without setting up the language-arts inhibition? If he can do so, then he demonstrates rapid learning capacity in this field which appears as ability to learn at a steeper gradient.

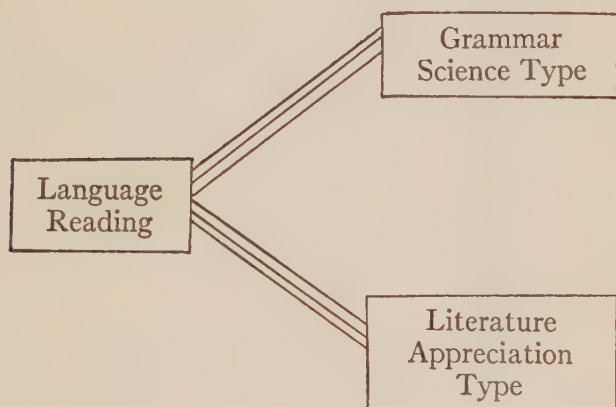


FIG. 13

The course sequence in language arts is quite different from that in the types previously discussed. There is but one course in a language-arts sequence—unless we introduce other courses of the language-arts type, specialized in their nature. Other courses belonging to the same general subject field, foreign language for instance, are necessarily either science type in their nature—the grammar course; or appreciation type—the literature courses. The reading course is necessarily prerequisite to either the grammar course or the literature courses, but the grammar course is not necessarily prerequisite to the literature courses.

In pure-practice courses of the second subtype, spelling and the number combinations particularly, we find still another prin-

ciple of sequence. In the diagram devoted to this type (Fig. 14), the dots may be taken to represent either blocks of spellings, individual words, or individual number combinations. Two principles are to be noted: first, there is no sequential relation whatever—the table of 6's is not an apperceptive prerequisite to the table of 7's; second, a pupil may reach adaptation level, that is, acquire a definite spelling sense or automatic control of his combinations, without traversing as exercises in order all the items

PURE-PRACTICE SUBTYPE B

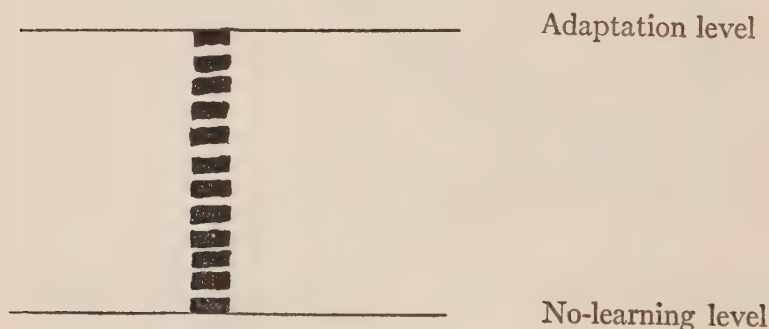


FIG. 14

involved or all the blocks of words in a spelling list. In this respect, the principle at work is much like that which appears in language arts.

It may be noted that there is never more than one course in the subject field of which we are here speaking. If the subject appears in different years, even in years as widely separated as sixth grade and tenth, it is nevertheless the same course with the same objective.

III

FAST AND SLOW SECTIONS AND SKIP SECTIONS.—With the foregoing principles in mind, the rational theory of sectioning classes becomes fairly evident.

In language arts or pure practice, where the assimilative practice is not a process of building up a coherent system of ideas but rather the attainment of special ability, adherence to a sequential order of exercises is meaningless. Referring to the language-arts diagram, we may conceive a section to be practicing with the exercises at level (1), another at level (2), another at level (3), and so on. The exercises for each are adapted to its own level of acquired special ability. However, a pupil in section 1 is found to be a rapid learner and he is encouraged to meet with both section 1 and section 2 for the time being. He soon catches step with section 2 and not inconceivably finds his way into section 3. The principle employed is what we refer to above under the term "skip section." In this type of teaching, there is of course no occasion for fast and slow sections except that a reliable prognosis test of language-arts ability, if such can be found, will minimize frequent transfers of individual pupils. Nevertheless, no such test should be allowed to preclude the operation of the skip-section principle if under actual teaching experience rapid learners are found. On the other hand, with both fast and slow sections organized or with the skip-section principle at work, or both, the slowest section rapidly becomes automatically the problem-case section.

In the appreciation type the objective is sense of value. There are no graded exercises for practice such as we find in the language arts, and hence there is no room for the skip section. There is no severely logical sequence of ideas, and hence there are not the restrictions which apply to the science type. We find, in general, two types of pupils: those who early catch a glimpse of the values, and those who are slow and require a great deal of teaching and guidance. It is obviously desirable to get these two types into separate sections and, it may be, to set up one or more intermediate sections. In a coherent and well-administered system, the school should know enough of its pupils to make the appropriate sections beforehand. It will be largely a matter of experiential background and reading interest at the time the sectioning

is made. If a high school is receiving pupils from schools which are not parts of the same administrative system, sectioning cannot properly be done until the school has had some experience with the new pupils and has come to know something about them. The conference groups are the appropriate places for such pupil observation and study.

Sections once formed, however, should not be regarded as permanent. Growth takes place, and a pupil who is today very slow in accepting values may, six months hence, exhibit a marked awakening. Hence it should be always possible to reassign individual pupils.

Again, as pupils become better known, it sometimes happens that an individual is released from a given course altogether or else meets with the class only occasionally. In either case, he is credited with the course.

In the science type, close adherence to unit and course sequence is ordinarily imperative. A pupil who exhibits rapid learning tendencies cannot be moved forward on the skip-section principle, but it sometimes happens that pre-testing a unit or even a course discloses the fact that a given pupil has acquired the essential learning product or products contemplated and can therefore either be released and duly credited or in some cases moved forward into more advanced sections. In the language arts, growing ability is the center of consideration; in the science type, adjustment. Mastery of the essential learning products must be assured from step to step.

It is gravely doubtful that there is much real difference in rate of learning in the science type, provided corrective teaching is diligently followed up and remedial cases duly identified and segregated. The bright and alert pupil tends to require more assimilative material, and he tends to be more superficial as judged by mastery standards. The statement just made should not be taken as a declaration of unvarying principle, but the tendency is evident enough to serve as a warning in administrative technique. The terms "fast" and "slow" sections as applied to the

science type are then singularly misleading in their connotation. Certainly they have nothing in common with the same terms as applied in language arts. If we use the terms "normal" and "advanced" sections, perhaps the meaning will be more exactly expressed. Let us see.

Nothing is more deceptive than the performance of a clever pupil in the science type, especially in mathematics. He "catches the idea" readily on presentation, he works through assimilative material rapidly and even responds well on the assimilative tests; he has all the characteristics of a "rapid learner," but he is prone to fail later in functional situations. His very apparent learning evaporates, simply because it was never mastered. On the other hand, we sometimes meet a pupil whose whole behavior in the presence of a given unit is evidence of not only mastery but of supplementary masteries. He almost invariably shows evidence of intellectual interest. His written recitations or unit reports are apt to be especially well handled. In such pupils we have good evidence of adjustment as well as performance, despite the fact that they may sometimes appear slow to the teacher who is devoted to performance standards and admiration of cleverness. Sections in which such pupils are gathered are truly homogeneous, while the mere rapid learner in this type may be a veritable problem case if he is thoroughly understood.

IV

EXPANDED CURRICULUM.—The ultimate utility of sectioning for fast and slow learners or on some other basis than rapidity of learning seems to be: first, that pupils can learn together better in sections composed of individuals of about the same development and learning capacity; and, second, that the fast section will complete the school career in less than the standard time allowance. The first objective is undoubtedly sound; the second may or may not be.

In the language-arts and pure-practice types, we have to do with subjects which contribute in the main the tools which give

access to the more fundamental adjustments of education. While the objective is an adaptation in the individual in the form of a special ability, no element of adjustment to environment is present. Some of the language tools are essential to all forms of intellectual adjustment, for example reading; others, while they are not essential, are of great service, since they give access to new fields of experiential material, for instance French or German. Now in the acquisition of these tools of education, the more rapidly they can be acquired and the more of them the better.

When we turn to the fundamental adjustments, however, the principle of maturity enters, as we have seen in the last chapter. The essence of administration then comes to be: first, to see that intellectual maturity keeps pace with mental, physical, and social maturity; and, second, to see that precocious intellectual maturity does not throw the pupil into social situations, lack of adjustment to which might prove distinctly harmful. To the case of this latter type of pupil, the principle of the expanded curriculum is especially applicable.

VOLUNTARY PROJECT.—One of the two directions in which this principle can be advantageously applied is that of the voluntary project, which we have discussed at length in the appropriate connections in Part III. Several obvious advantages are economically attained.

First, the pupil of somewhat precocious intellectual maturity is profitably occupied while his social adjustments are being normally made through contact with his contemporaries.

Second, the rapid learner in the long assimilation period of the science type rounds out and expands his experience in the subject being studied while his slower classmates are approaching full assimilation. Not infrequently we get in this way our best evidence of adjustment. The need of sectioning is minimized, and in the small secondary school this is a decided advantage.

Third, the teacher is thus enabled to identify, study, and further the growth of genuine intellectual interest.

Fourth, the pupil who is genuinely talented, not merely bright,

is given valuable training and experience in self-dependent study; he justifies his superiority, not by grades and indices of brightness, but by work and production.

ADDITIONAL COURSES.—The genuinely rapid learner who is still socially immature but has developed general intellectual interest can often be encouraged to expand his curriculum by electing additional courses. Additional courses in the languages are especially desirable since every new language acquired means an additional tool for use in accumulating educational experience. Additional courses in the subject which contribute the fundamental adjustments of course expand the pupil's horizon and, in pedagogical terms, the apperceptive mass which he will bring to the acquisition of later adjustments.

COLLEGE COURSES.—The high-school pupil who is intellectually prepared for college at an early age is apt to encounter a more or less perilous experience if he passes on to college with students who are several years his senior in chronological age and social development. The work of the first two college years is ordinarily of secondary type, a period in which most students in the traditional four-year college which succeeds the four-year high school are arriving at intellectual maturity or self-dependence. Thrown into such a college life, the young boy is rather likely to find himself in courses which he carries much more readily than his mates, and in a social medium into which he is far from having normally grown. The college makes certain assumptions of social maturity; it takes for granted that students have learned how to manage their own lives with some degree of wisdom and self-restraint, and it provides a minimum of machinery for individual supervision. The young student is therefore thrown on his own resources at a time when he has not learned to take care of himself, and, on account of his intellectual advancement, he is apt to have more idle moments than the older students whom he meets in the classroom.

Now, while there are of course the foregoing and other individual exceptions to the rule, it still remains true that the impor-

tant difference between the students of the first two years of the four-year college and those of the last two years is intellectual and not social. There is apt to be a marked change in social and physical development at about seventeen or eighteen years of age in the boy and somewhat earlier in the girl. Sexual maturity has become well established; the severe storm and stress of adolescence is largely over. After that period, development goes on more slowly, and it is of a different kind. There is much less social and physical difference between the boy of eighteen and his older brother of twenty-one or twenty-two than between the former and his younger brother of fifteen or sixteen. But, except for intellectual attainments, eighteen is as much the senior-college age as the junior-college age. If, then, the advanced pupil who is intellectually ready for college at fifteen or sixteen continues in the local high school with junior-college courses until he has reached the comparative stability of eighteen or thereabout, he may undertake senior-college or pre-professional work at the latter age without serious danger to his social development and with a very desirable saving of time. Those universities which are most alert to institutional adaptation in effect recognize the principle in their provision for advance credit. The local junior-college movement is an illustration of a tendency to adapt our whole institutional organization accordingly.

V

THE PUPIL RECORD.—The center of administrative technique is in its records, but records are valueless save as they reveal facts which are pertinent to the process being administered. Now, as we have abundantly seen, the process is one of growth in the pupil. To record facts which are unrelated to growth is a waste of time and energy, and to do so may easily divert the purposes of both teachers and pupils into channels which are entirely foreign to education.

The result just mentioned is exceedingly apt to be the outcome when the term *credit* is employed. The term is commercial in all

its common connotations, and it quickly becomes a verbalism which dominates and perverts administrative thinking, and the thought of pupil and student, all the way up to the ultimate credit in the doctor's degree. We have dealt with the matter as affecting the whole purpose of the school and its theory of education in Chapters iii to v. In brief, the word is absurdly inappropriate to the terminology of teaching. If used at all, its meaning should be simply that record of personal attainment gained and verified is made.

Now the significant items of progress are units mastered, and interest noted and self-dependence attained. "Units mastered" at once suggests marks and grades as terms in administrative thinking.

MARKS AND GRADES.—Marks and grades, as they are commonly used, do stand for credit in its legitimate and commercial sense. The pupil is the party of the first part in a contract, the school is the party of the second part and the grade, which is a record of acceptable performance, is the consideration. Neither learning nor education is in the transaction save by assumption, and we have seen how and wherein the assumption is badly founded.¹

On the other hand, in so far as any system of grading is clearly recognized by all concerned as simply a system of shorthand for recording the learnings attained or the pupil's personal qualities, it is pedagogically valid, and it makes little fundamental difference what the symbols are. In our laboratory practice, we have lately been using M, N, and R to stand for "mastery," "sustained interest," and "self-dependence" respectively. Thus MN signifies at once a pupil who reveals mastery plus demonstrated interest in the course he is pursuing, MNR stands for mastery plus interest plus characteristic self-dependence. Other letters would have done as well, and we might go farther and add sundry designations to indicate various other acquired qualities. For instance, we might add 1, 2, and 3 to stand for several levels of skill

¹ See chap. iii, p. 44.

in courses in which the skill element appears, or we might add a performance-test score for skill. For example, MNRC⁸⁰ in French I would mean "Reading adaptation, plus evidenced interest and self-dependence, plus facility in reading as disclosed by a score of 80 on a given test."

Such values as are recorded in the books should be entered therein by the administrative office upon the evidence submitted by the teacher. The teacher's mind is wholly concentrated upon the collection of evidence, and is divorced from the purely subjective attitudes which are bound to arise whenever two personalities come into close relations. True, such attitudes are prone to bias more or less the collecting of evidence itself, but, in centering the teacher's interest and attention upon the evidence rather than upon the grade, we at least minimize rather than exaggerate subjective influence, and we further exalt in the teacher's mind evidence which is educationally valid as opposed to evidence which is doubtless objective but of doubtful validity.

EVIDENCE OF INTEREST.—Interest, as we have discussed the term in sundry connections,² is as much an objective of teaching as are the units in organized courses, but it is not unitary in character and therefore cannot be recorded as a separable attainment. The primary concern of the school is noting, studying and recording the evidences of interest, and for this purpose a regular personnel report from all teachers on which, among other things, evidences of interest are recorded, is appropriate.

There is necessary, first, assurance on the part of the administrative officer that the teachers themselves are perfectly clear as to the meaning of the term; second, there is apt to be required a period of teacher-training in which a sense of the weight and bearing of evidence is developed. It is perhaps worth while to study here different types of personnel reports in this connection.

1. Seems much interested in ———. Frequently asks questions which are very much to the point. Takes an active part in discussion.

[Such a report is evidence that the subject-matter is appealing

² See especially p. 34.

to the pupil in question and that he is actively attentive, but it is not evidence of interest. He is probably a rapid learner, and very likely is such because the course appeals to him. Interest is of the passive type, however, which is characteristic of a childish stage in volitional development.]

2. Reads widely in ———, and frequently comes to me to talk about books she has read. I have looked up her free-reading list and find that she has read five rather substantial volumes in the last month besides several minor but wholesome books, all of them closely related to the subject.

[This report is good evidence of interest because it testifies concretely to genuine effort. It is what we expect to find normally at fifth- or sixth-grade level or perhaps in the junior high school. The child has not yet arrived at the stage at which she can plan and carry out a systematic independent enterprise.]

3. Has done a great deal of reading which is on the whole of a substantial character. Every day or two asks if I am going to send home a favorable comment.

[Evidence of a *quid pro quo* attitude but not of interest.]

4. Selected as a voluntary project ———. He has planned his enterprise, devised working apparatus, and has worked hard at it all winter after school. Has submitted a good written report.

[Perhaps the best evidence of interest and also of dawning self-dependence.]

5. Has made polished translations of many passages from our course in Cicero. Has undertaken no specific project and seems to do this work for sheer love of the thing.

[As good evidence of interest as the preceding but not as good evidence of self-dependence.]

6. Wrote a very interesting account of his summer vacation.

[Evidence of interest in the vacation but not of interest in the subject he is studying.]

As such evidence is noted by the teacher and recorded, the latter has a basis, first, for keeping alive this interest and stimulating the growth of other interests; and, second, for noting the pupils in whose cases interest does not yet appear. The latter have perhaps not yet ripened to the point at which it would normally

appear, or it may very probably be that some of them require the kind of intimate personnel work which is calculated to develop the spirit of hard work (see chaps. vii and ix).

In the end, the administrative officer has ground for deciding whether or not the pupil has taken on the characteristics of interest in his whole attitude toward life—whether or not he is likely to exhibit in later years an inclination to use his educational capital. The decision upon this point must rest upon the evidence of sustained and consistent interest. If we look back through the personnel reports and find here and there a good piece of evidence but no continuous and consistent story, we cannot conclude that the pupil has taken on the characteristic which we have in mind. If, on the other hand, we note in early reports an occasional bit of evidence and as the story goes on a steadily accumulating series, ending in a consistent record of the attitude in some form in almost all the school work, then we can conclude that the pupil has acquired the characteristic. Again, however, we may note that the earlier bits of evidence eventually run into a record of quite unusual special interest in a particular line of study united with marked attainment and special ability. In that case we probably have evidence of special talent.

EVIDENCE OF SELF-DEPENDENCE.—Mature personal adaptability implies mastery of an adequate educational capital; it implies inclination to use that capital; and it implies the volitional maturity coupled with the right study capacity which enables the student to find his problems and work at them without, on the one hand, being compelled to do so by external pressure or, on the other hand, having the teacher constantly at his elbow. In other words, the pupil is educated when he can be trusted to find his own way about the world, both as a matter of taste and conduct and as a matter of intelligence.

Training in self-dependence begins, of course, in the kindergarten and in the home. Indeed, we may say with considerable assurance that the child's normal growth is along the line of self-dependence. Spoiling in the home or in the school is the genera-

tion of a pathological condition by persons or agencies external to the child himself. The constructive educative influence is largely negative, that is to say, preventing the teacher and the parents from interfering with normal development. It is not wholly negative, for the child will not mature volitionally unless he is provided with the necessary media in the form of tasks.

The teacher interferes when she insists on answering questions which the child can answer for himself. The supervised-study periods, for instance, are occasions in which the teacher must exercise the most extreme care not to give help when the pupil can help himself. One of the chief occasions for the growth of the supervised-study movement is found, historically, in the fact that the home could not be trusted not to get the pupil's lessons for him. Again, the school spoils the pupil hopelessly when it establishes and tolerates a system which permits and encourages him to develop the "get-by" attitude, or when it allows him the luxury of cheap promotions. As in the case of interest, administrative technique is concerned with evidence of growth and such evidence is gathered in the form of personnel reports. Here, as in the case of interest reports, there must be definite assurance that the teacher understands exactly what is meant by the term used and understands the nature and weight of evidence. Evidence is found in careful observation of the pupil's behavior.

During the greater part of the later elementary period, and perhaps well on into the junior high school, favorable personnel reports will be prevailingly negative. That is to say, they will exhibit little marked evidence of self-dependence but they will not disclose continued dependence. On the other hand, the teacher who is thoroughly competent and alert will be constantly watchful for signs which indicate developing positive self-dependence or the contrary. Typical reports are the following:

1. Fifth year. Mary continues to require much help during the supervised study period. I have tried leaving her to her own resources, but the result is that she does little or nothing.

[Evidence of marked retardation, probably requiring study of the pupil, especially in her home surroundings, and vigorous special treatment.]

2. Fourth year: Freda is growing in self-dependence. She has greatly improved in punctuality.

[First part, mere unsupported opinion. Second part, no evidence of self-dependence, but simply of desirable adjustment to school routine and, if generalized, of a basal conduct attitude.]

3. Sixth year: Frederick has carried on a regular business of clearing sidewalks in his city block all winter. It seems to have been his own idea. In his school work, he learns well and with moderate rapidity. He never asks for help except in places where some individual teaching is really necessary.

[Good evidence of normal development which is beginning to show characteristic positive signs. From about the age of ten, especially in families in which children are well brought up, these positive signs begin to appear.]

4. Fifth year: George has not required reteaching at a single step on the last three units.

[Not evidence of self-dependence at all but simply of good development in learning capacity and study habits.]

5. Ninth year: Sarah has worked through all units in cooking without help from me, and I find that she has assumed responsibility for the family breakfast.

[Excellent evidence of the same type as No. 3, but of more mature development.]

6. Tenth year: In his "Community Civics" class James became interested in the history of the churches in ———. So he took this as a voluntary project. He has delved into the records of the local churches and produced a really creditable report.

[Evidence of both interest and self-dependence and further evidence of incipient creative capacity. The term "genius" should probably not be used with quite the abandon which has become fashionable in school circles, but behavior such as is here described is at least as good evidence of the quality as a mere index of brightness.]

7. Twelfth year: William and Frances have both been excused from attendance at meetings of the class for the entire semester. They

have occasionally come to me for advice and they have reacted successfully to all unit tests.

[This is the final and probably conclusive evidence.]

When pupils show a record of normal volitional development throughout their school careers, marked by appropriate occasional positive symptoms such as those which appear in Nos. 3 and 5, and supported by corresponding conduct records, we may conclude with some confidence that they have reached volitional maturity. When they exhibit evidences of the adjustments proposed by the curriculum, we may properly infer that they have attained their general education. Note, however, that behavior such as that revealed in No. 6 is not a part of the evidence of general education. It is rather evidence of special talent and as such should mark the pupil as a fit subject of special concern and wise guidance.

VI

REPORTING.—We have thus dealt with the record of pupil progress as it appears in the school's big book. But record-keeping is not all. The competent supervisor of teaching and the head of the personnel department of the school require continuous information on other matters than final pupil record at the end of a course. The supervisor should further have in his possession adequate reports of courses as well as of pupils.

THE COURSE REPORT.—During the progress of a given course, the teacher in charge has his problem of teaching, and for the effective teacher the problem is ever new. He studies the most effective means of presenting his subject matter to the particular group now before him. He locates his problem cases, in consultation with the personnel officer he segregates the remedials, he devises and applies corrective treatment to the non-remedial. He devises the tests best calculated to give him objective evidence of the learning situation. He guides study, teaches, and reteaches. In the end, the course is completed and the record is made up.

Now in a very true sense the thesis of this volume centers on that course record. Let us remind ourselves that such is traditionally a record of the teacher's judgment of relative average performance in class of the several pupils without regard to pupil study and corrective teaching. Attention is centered upon performance and not upon adjustment. If attention is reversed, the record will contain the following elements:

First, it will enumerate the pupils in whose cases the instructor honestly believes that he has evidence of mastery as disclosed by his test sheets. He will realize that later functional tests as developed in the school experience may disclose that he was mistaken in some cases. He will preserve a mind open to such revelations and willing to reconsider his teaching in the light thereof.

Second, the record will show the voluntary projects, by whom undertaken and the value which the teacher attaches to each as symptomatic of pupil development.

Third, the record will enumerate the pupils in whose cases the learning or adjustment contemplated by the course is incomplete. These incompletes will probably be such, either because of interruptions occasioned by absence or because they are still corrective cases at the end of the course. The presumption is that such pupils will complete the course, probably in a later section, possibly at the hands of a private tutor approved by the principal. It is perhaps needless to point out that a grave impropriety is involved in the private tutoring of such pupils for pay by the teacher who has conducted the course or by any person designated by him. Designation of the private tutor by the principal removes all color of impropriety. The principal may solicit the teacher's advice, but the teacher will not offer a recommendation. Further, the school has a right to require that it shall designate the tutors of pupils for whose education it is in general responsible.

Fourth, the record will enumerate the pupils who are problems at the end of the course, who have not attained the learning products contemplated. The evidence will show whether such pupils

are to be rated as corrective or remedial. If the weight of the evidence shows that a given pupil is still a corrective case, he will be rated as "incomplete." In such cases, the pupil will have made consistent progress, but, owing to his handicaps, will not have completed within the period for which the record is made. The presumption is that the teacher has identified the pupil's learning difficulties and has concluded that they are in process of correction. If, on the other hand, the teacher does not know what the matter is, then the case is remedial.

It will be recalled that remedial cases may have been identified on positive grounds earlier in the course. For instance, a non-learner may have been identified as lacking the primary reading or number adaptations or as being so defective in general apprehensive mass that his whole ideational background must be reconstructed. If, however, a problem-case pupil who has been thought to be a corrective case comes through to the end with no consistent and positive record of learning, he becomes automatically a registered remedial case.

NO FAILURES.—It will be observed that we have no place in the course report for failures. If the school conceives the office of teaching to be summed up in assigning and hearing lessons and recording grades, the term "failure" as applied to pupils is entirely comprehensible. If, on the other hand, the school conceives it to be its task to guide the development of immature youth to the level of educational maturity, it is as incongruous to apply the term to a pupil who has not learned as it would be for the physician to designate the patient who has passed out of life a failure, on the ground that he did not get well. There is always a cause for non-learning, despite the fact that not all causes are known and identifiable. Systematic teaching attempts to find the cause and abolish it, or else to find on positive grounds that the cause is in fact ineradicable.

PERSONNEL REPORT.—Not only is the teacher in the administration of a course concerned with the pupils in whom he is en-

deavoring to develop the new attitudes or abilities which the course implies, but the administration through its personnel office is also concerned with a continuing census of the personnel problems of the school. It logically rests with the personnel officer to decide when a given pupil becomes a remedial case in one or more particulars and to be registered as such. There is thus required from the teacher: (1) periodic personnel reports on different individuals, and (2) a final personnel report at the end of the course.

The periodic report—once a week or for such other interval as is found convenient—deals only with pupils who are exhibiting markedly successful learning and with those who are definitely problem cases of one type or the other. It also records data which are significant as evidence of developing right attitude toward conduct or the opposite. On the whole, the best form for periodic personnel reports is a blank card of convenient size upon which the teacher records the evidence as he sees it. If a printed form on which the teacher checks certain spaces is used, the latter tends to adopt a mere clerical attitude. The look of things is simply one more bureaucratic report. On the other hand, the blank card tends to stimulate the teacher's actual observation and study of pupils. When a printed form is rated, that is the end of the matter. If, on the other hand, a blank card comes to the personnel office nearly in its virgin whiteness, or if the record made thereon is without evidence, in either case there is a basis for conference between the personnel office and the teacher concerned and for a piece of constructive training of the latter. The rated printed form facilitates business and gives the appearance of administrative efficiency; but we never know what it means in concrete terms. The blank card may indeed remain all but blank when the printed form would be completely filled out, but at least we have the evidence of the teacher's vacant mind and the basis for training. When the blank card contains a clear and definite statement, we get a concrete picture of the pupil. Naturally and properly, the card returns will yield almost as many different

types of content as there are pupils in the class, and we cannot completely cover the ground with illustrative instances. The following will, however, suggest types of good and bad reports.

1. Does not seem to concentrate.

[A poor report. It records only an impression, vague at that, and it proposes no definite treatment.]

2. Does not concentrate. See three application profiles attached. Dawdling the chief difficulty. Have taken steps to develop better habits. Some improvement. Will report later.

[Good in exactly the particulars wherein 1 is weak. We shall naturally look for another report later and here it is.]

3. Previous reports noted dawdling. Have kept at the matter of correction. Practically normal. See attached profiles. Rate of learning greatly improved.

[We might have had 4 instead of 2.]

4. Does not concentrate. See application profiles attached. Is nevertheless one of the most rapid learners. Is getting into bad habits. Recommend transfer to fast section. Or perhaps this: Have succeeded in getting him interested in voluntary project.

5. Is steadily dropping behind class. Works very slowly, but seems conscientious.

[Vague and meaningless. A better report would be 6.]

6. Is steadily dropping behind class. Works slowly but conscientiously. Suspected reading difficulty. See approximate eye movements. Apparently a decipherer. Recommend remedial work. Sensory organs seem to be O.K.

7. Is becoming a conduct problem. He neglects his work and is inclined to rowdiness in the corridors. Met him Saturday with a group of hard-looking youngsters on ——— Street. Admits that he is out late nights and gets little sleep. Have seen the mother who is greatly worried. Recommend action by the personnel office.

[Good. Concrete, definite evidence, intelligent recommendation.]

8. Has worked consistently on three good voluntary projects since the beginning of the year. His regular work is done promptly and well. Interest in successive projects has grown out of the preceding. Has

had little help from me and shows marked originality. Completed reports are on file. Interest and self-dependence.

[Good because it is concrete and conclusions are backed by evidence.]

The final personnel report should be the teacher's judgment of pupil personal progress or lack of progress during the continuation of the course, in brief, a final characterization. The periodic report serves as a basis for immediate personnel work by the teacher or the office; the final report is for the record and the pupil's case history.

NOTICE TO THE PUPIL AND TO THE HOME.—The teacher who has dispassionately and thoughtfully observed the day "for giving out marks" is familiar with one of the stupid brutalities of life. Days of mischievous anxiety for some pupils, and expectant smugness for others, precede these periods of classification. "What did you get—I got an A." The despairing invite no inquiries, but unhappily they are the very ones who serve as foils for the feeding of infantile egoism in others. The Evil One himself could never have invented a device more skilfully devised to undo whatever conduct the school may have begun to build up or to generate more effectively superfluous emotional disorders. If the thing were necessary, we should have to make the best of it and learn how to minimize its bad effects; but it is not necessary. The common allegation, apart from the credit delusion, is that the pupil must know how he stands. Bless our hearts! If he has gone for three months or five without knowing whether he is learning or not, what conception of his office must the teacher have had! Even with advanced college students, I can think of no more ridiculous injustice and no worse pedagogical malpractice than to hold a student up until the end of a course before giving him any positive guaranty whether he is learning or not learning. Whatever marks we may assign, their legitimate office is that of contributions to a more or less scientific record and not that of *ex post facto* stimuli.

But at least the home should be informed? Quite right, but for

what purpose? Presumably home and school are co-operating in the upbringing of a human being into the status of civilized man or woman. That being the case, the home should be kept informed of the contributions it may from time to time advantageously make and furnished with the information which it plainly should have in its possession. But all such should be in plain English, supplemented by personal interviews whenever necessary, instead of in the form of a report card which is somewhat less comprehensible to most parents than the terms of the monthly electric light bill and father's insurance policy.

CHAPTER XXX

THE PROBLEM PUPIL—CASE WORK

WE have already defined the problem pupil as one who in fact does not respond to the ordinary processes of classroom teaching or to the influence of the school, according to expectations. We emphasize the fact rather than the appearance or normal response. Children and young people are exceedingly plastic, and they often exhibit very great capacity for adapting themselves to what they know to be the expectations of the teacher or parent. Hence, what may appear to be normal response is often mere conformity. Diligent and consistent individual study of all pupils is the only secure foundation for effective teaching.

I

SOCIAL JUSTIFICATION.—Periodically the question is raised, "Why spend time and energy on the inferior pupil, to the neglect of young people of parts who are endowed by nature with the possibility of large contributions to the well-being of society?" The query is plausible and appealing, but it begs several questions, and in addition it overlooks some extremely important issues.

In the first place, we do not know who are the inferior pupils, apart from searching study of individual cases. The gross fact that a pupil does not do well on routine school performance, under teaching which may itself be inferior, is no valid evidence of natural inferiority in the pupil. We can, to be sure, utilize tests which will beforehand with considerable reliability pick out the pupils who are not likely to do well on specific school performance, but such test results do not explain the all-important issue why and wherein the pupils thus identified are inferior. Conversely, superior performance under school conditions, such as those to which we have just referred, is not in itself evidence of superiority.

In the second place, our knowledge of what constitutes inferiority is but meager. Mental subnormality we know, and while it is sometimes not easy in the case of an individual to decide whether the pupil is normal or feeble-minded, we at least know what we are talking about when we deal with the term feeble-mindedness. The majority of our pupils who exhibit inferiority in school performance are normal; their inferiority remains to be defined. In many such cases, and perhaps eventually in all of them, we can succeed in putting the finger upon the eradicable factor which is causing the inability. In brief, it will not do to classify our failures as the identified subnormals and "other inferior pupils." Conversely, genuine organic superiority can be understood only as a matter of a great variety of individual traits or special talents, and these can be identified only through critical examination in a school situation which is calculated to give opportunity for such traits and talents to become manifest. Mere brightness or mere rapid learning capacity in itself is no evidence of essential superiority. The slow pupil who is possessed of vision, a discovered purpose in life, an absorbing interest, a creative talent, has within himself elements of intrinsic value which the bright pupil not so gifted has not. Much as in the case of inferiority, the thoughtful teacher is interested in pupil superiority only in so far as he can find out wherein superiority consists.

In the third place, it by no means follows from any facts which have as yet been adduced in evidence that schools are to any large degree devoting disproportionate time and energy to assumed mediocrity and assumed inferiority. The facts are being collected, but meantime contemplate the average class period, consider the opportunities accorded the obviously interested and responsive, in comparison with the time and attention devoted to the slow and unresponsive, and then impartially answer the question, "What type of pupil gets the most attention?"¹

¹ In an unpublished study, McCullough (1927) found the comparisons in amount of time devoted to bright and dull pupils in six different communities widely distributed over Kansas. His principal findings are noted.

x. On a five-point distribution of pupils from brightest to dullest, in gross op-

Whatever may be the difficulties in the way of teaching and administering the problem pupil, the large fact remains that an individual who remains unadjusted to the world in which he finds himself is not only a social burden, a tax upon the energies of the adjusted and competent, but he is a hampering obstacle to social progress itself. The dependent, delinquent, and defective classes are largely made up of unadjusted, maladjusted, and perverted individuals.

Of these three categories of social pathology, other agencies than the school have chiefly to do with the defectives. Nevertheless, the school cannot overlook them, first of all because it is in the school more than in any other modern institution that the defectives can seasonably be located, studied, and put in the way of such adjustment as their condition requires. Adjustment may, of course, in the case of the definitely feeble-minded, consist in commitment to some form of permanent custodial care.

portunities to participate in the use of teacher's time, the average per pupil in the periods under observation were in order: 3.6, 3.2, 3.0, 2.4, 1.9.

2. In actual amount of time devoted to the several groups, the ratio is expressed by the following figures: 61.4, 51.0, 47.2, 42.1, 36.5.

3. The amount of time outside of class devoted to the brightest, as compared with that devoted to the dullest, was in the ratio 11.24:13.35.

4. During study period, the teachers' concerns for the five groups were as follows: 2.5, 1.8, 1.5, 1.1, 1.2.

5. In view of the very natural contention that children who are alert and bright succeed in *claiming* the teacher's time and attention, the investigator submitted the issue to fact-finding. He found that in truth the bright children do claim the teacher's attention; but he was also able to separate these instances from those in which the teacher manifestly did confer her attention uninfluenced by the pupils. He found that his teachers discriminated little if any between pupils in the three brightest groups, but that those in the fourth group, less than average, received only six tenths as much attention as the others and that the dullest pupils received only such attention as they claimed.

Kansas may be peculiar in this respect, and these six communities may be peculiar in Kansas, but we have no reason for thinking so. I do not see how anybody who has taught for any considerable time himself, or has supervised the teaching of others, could expect the facts to be materially different from these anywhere. The unverified assumptions on this point of many of the writers in educational psychology are apparently not only wrong but diametrically wrong.

Extensive study of the delinquent and pre-delinquent, if we eliminate those who are actually cases of mental pathology, leaves little room for doubt that most such enter upon the delinquent career as problem cases in the school or in the home. Whether they originate in the school or in the home, the school can be and should be organized to identify such cases in their inception and to deal with them in that systematic and positive manner which we call scientific. Study of pedagogical cases especially makes it very evident that many if not most pupils who are eventually classed as conduct cases start the career of maladjustment as learning cases in the school arts. Conduct cases in the school are only too apt to appear in society as delinquents. The apparently increasing drag of the delinquent upon society, especially in the abnormally rapid development of modern society, is too obvious to require comment. What boots it to identify the superior pupil and bend our energies upon teaching him, to the neglect of the problem cases arising all about us, under the complacent belief that we are "training a leader," if, for every leader we so train, we train two others to thwart him and a multitude so essentially unenlightened that he cannot lead them? Especially, if our "bright pupil" may turn out in the end a superdelinquent?

Again, the study of dependent case histories, apart from mental pathology and apart from the pure hazard of life, leaves little room for doubt that most of our dependency originates in the problem cases of the school and the home. Sheer lack of education, plain ignorance, accounts for much, perhaps most. Shiftlessness and thriftlessness, which are only other terms for volitional retardation, account for the remainder or most of it. These in their turn originate in either positive spoiling or plain neglect. The fatalistic verdict, "Does not concentrate," is typical of the school's fatuous neglect of these problem cases. Of what service is it, either to society or to the individual, to focus our energies upon the superior pupil if in so doing we neglect a dozen, among whom will be recruited the helpless dependents who will tax the energies of our youth of parts in his contributions to the numer-

ous public and private charitable enterprises which are maintained to provide a living for those who will not or cannot support themselves?

Nor is the social well-being the only objective. The democratic Christian State is founded in large measure upon the recognition that the human individual has worth and rights in himself. We find this conception embodied in our own national enunciation of political philosophy, in its declaration of the inalienable right of the individual to life, liberty, and the pursuit of happiness. None of us comes into this world of his own free will. Once here, we doubtless grow into a set of inescapable obligations which we owe to society, but it is none the less true that society through its institutions owes to the individuals thereof certain obligations. During the period of immaturity the right of the individual as against the right of society bulks large. The problem pupil did not create his own problem; it came to him in one form or another. Hence, whatever may be the compulsion laid upon the school by social need to give heed to the solution of its pedagogical problems, the pupil has a right to the school's ultimate effort simply because he is a child and a pupil.

II

THE CORRECTIVE CASE.—We have elsewhere divided problem cases into two groups, the *corrective* and the *remedial*. The corrective case has been defined to be one which is susceptible of treatment within the pedagogical resources of the regular course in which the pupil is enrolled. Probably most pupils, if studied closely enough, are corrective cases to a greater or less extent. Corrective case work is essentially the reteaching member of the mastery formula. Supervised study is especially, in large part, a period for pupil study, identification of the points at which corrective teaching is required, and application of the appropriate procedure.

The number of problem cases which later become remedial and require systematic case work will depend very closely upon

the critical observation of pupils, and upon the ingenuity and diligence which are throughout the school brought to bear upon the prompt identification of corrective cases and upon their successful adjustment. In all but a small minority of maladjustments and outright school failures, the mischief gets started in minor but critical pieces of non-learning or perverse learning or in the taking on of perverse attitudes toward learning of one sort or another. All of the cases which have hitherto been cited in illustration of points made in this volume are instances. Sometimes, as in the case cited later from *Three Problem Children*,² an uncorrected first-grade reading difficulty is allowed to drift along in the unpardonable incompetency of passive acceptance by the teacher and the school until the pupil is hopelessly out of step and an initial learning difficulty has become a serious personality disorder. In this case, society through one of its fundamental institutions, the School, callously consigns the individual to a life of wretchedness, from which she is rescued only by chance. If the pupil, instead of being a girl of introvert temperament, had been a vigorous extrovert boy, society would have paid the penalty of the school's incompetency in a youthful gunman or some other kind of criminal. There are no doubt myriad forms of corrective cases. Learning which has gone awry will turn up in most unexpected places.

There are, however, certain major directions in which it is most likely to appear and these have already been studied: (1) in the long series of learning products which we have discussed in Part II and Part III; and (2) in our gross analysis of the principal factors in the personal basis of learning capacity found in chapter xxviii.

III

THE REMEDIAL CASE.—There should be a degree of formality connected with the handling of remedial cases, first, because the teacher is humanly prone to treat all obstinate corrective cases

² Narratives from the case records of a child-guidance clinic; Joint Committee on Methods of Preventing Delinquency (New York).

as remedial; and, second, because successful remedial work requires prolonged investigation and treatment. Hence, a given case should be settled upon as remedial only by the personnel officer after consultation with the teacher or teachers concerned; it should be registered as such in a book kept for the purpose; and it should be carefully written up, from the survey of symptoms to follow-up, and the record preserved in its appropriate folder. A sample page of an appropriate registration book is shown in Table XVI.

TABLE XVI
REGISTER OF REMEDIAL CASES

No.	Pupil's Name	Date	Birth	Years in School	Classification	Diagnosis
1	Doe, John	3/10/23	4/8/09	8	Learning	Experiential
2	Roe, Richard	3/10/23	20/9/10	7	Conduct	Emotional
3	Adams, Mary	3/10/23	15/7/07	11	Learning	Vision
10	Roe, Richard	10/9/24	20/9/10	8	Conduct	Emotional
	Assigned to	Date of Discharge	Results	Follow-Up	Notation	
1	Smith	1/2/24	Adjusted	6/6/24	Confirmed	
2	Thompson	15/6/24	Improved	10/9/24	Relapsed	
3	Dr. Blank	4/12/23	Adjusted	1/6/24	Confirmed	
10	Thompson	18/6/25	Adjusted	1/10/25	Confirmed	

The record on the register is made up as the case progresses. At the time of identification and assignment, the pupil is given a number, his name is entered with the date of registration, the date of birth rather than the age, years in school rather than grade, classification as either learning problem or conduct problem, and the name of the teacher or other person in charge of the remedial treatment. The other entries are made as data are assembled and findings discovered. The diagnosis is entered in terms of the fields in which defect or disorder is found. A convenient classification is that which is suggested below.

1. Psycho-physical elements

Conditions of the nervous and muscular organism by which stimuli are received and reactions are carried out. Vision, hearing, speech, co-ordination, reaction-time are illustrations.

2. Health elements

General functional condition of the bodily organism affecting learning. Other things being equal, the pupil who is possessed of sound bodily health will learn fastest

3. Experiential elements

a) General apperceptive mass, that is, the extent of ideational content which is presented to the assimilation of new ideas.

b) Organized intellectual content, that is, the learning products which have been acquired and correlated and which are available to the pupil for thinking his way through new situations—what we ordinarily call “preparation.”

c) Methods and habits of learning and study.

4. Emotional elements

Feelings toward learning. Confidence, interest, antipathies toward teachers, admiration of teachers, attitudes toward classmates, over-valuation of self, inferiority feelings, are illustrations.

5. Volitional elements

Attitude toward effort, application, standards of performance, get-by attitude.

6. Mental elements

Organic learning capacity. We may keep in mind four distinct terms:

a) Subnormality.

b) Brightness and dulness.

c) Disordered mentality, that is, psychopathic conditions which affect mental functions such as perception, judgment and the like.

d) Special talent.

The classification as suggested is sufficient for purposes of registration, but the diagnosis proper is worked out in detail in the case history.

When a pupil has arrived at the point at which he is in reality a remedial case, a very searching systematic investigation is called for. Every precaution is taken to avoid guesswork. A volume might well be written on the subject; we must be content here with a bare outline. Thorough training for remedial case work and treatment must lay under contribution the literature touching the learning of children in school, and it also involves excur-

sions into the fields of medicine and psychiatry and psychology. Happily, in most remedial cases the maladjustment is at bottom very simple. Given reasonable pedagogical sense and scholarship and familiarity with the technique of case work, successful practice requires chiefly honest diligence and common sense. In a minority of cases, the root of the trouble lies in the fields of various specialists. The well-trained remedial case worker needs to know enough about these several fields to be intelligent as to their problems and procedure, but in no sense a specialist.

CASE INVESTIGATION.—It will perhaps prove helpful if the student keeps in mind that every case investigation can be thought of as consisting of three major divisions:

- I. What is the matter now
 - Presenting symptoms
 - Examination
- II. Where and when did this trouble start
 - Health history
 - School history
 - Family history
 - Social history
- III. Why did it start—diagnosis

The procedure described in the following pages is used in case study. The investigator keeps in mind, throughout, the list of conditioning factors to which reference has already been made, namely, psycho-physical, physical, experiential, emotional, volitional, and mental, until he has worked out his diagnosis. There is practical value in the order of consideration as given above.

The old-time schoolmaster was inclined to rate all his problems as volitional, and application of the birch was his comprehensive plan of treatment. His descendant is prone to rate all problems as mental. Both are unacceptably crude diagnosis. Most remedial cases of long standing have become a tangle of primary and secondary and contributory causal factors, but a case is rarely found in which the trouble did not originate in some one cause or set of causes. It is in the highest degree important to good admin-

istrative technique to identify the origins, both because intelligent remedial treatment in the case itself requires such identification and, even more, because light is thus secured which will enable the administrator to take steps calculated to minimize the recurrence of similar cases.

Such identification is a matter, not only of noting the more or less obvious causative factors as they now appear, but also of eliminating other possible but less obvious factors. Hence, our first steps as a matter of routine are to make sure that there is present no hampering condition in the psycho-physical organism or in the general health of the pupil. It is worse than a waste of time to work out various defects in the experiential background and leave uncorrected an organic difficulty—defective vision for instance—which was very likely the original causation, which will in any case prove a hampering obstacle in the treatment and a possible occasion of relapse after treatment. On the other hand, emotional and volitional factors are on the whole more likely to be the effect than the cause of experiential defects. Accordingly, the good investigator, as he works through a case, does not allow interesting emotional or volitional symptoms to take first place in his attention until he is satisfied that one of these and not experience was first in the chain of cause and effect.

Logically, mental conditions should stand first, and the investigator should make sure that he is dealing with a normal and sound mind before he raises other questions. Practically, there is as yet no means of identifying mental defect with anything like the positive assurance which examination of the sensory organs and general health condition is capable of yielding. To be sure, the evidence of definite feeble-mindedness, especially in the earlier years of the secondary period, may be clear, and, in that event, the diagnosis and plan for treatment are reached very promptly. Mere border-line mentality or dulness, however, would best be left until the evidence touching other factors is all in. The character of response to treatment itself is often the only means of reaching a final conclusion on the question of mental

capacity. The appropriate attitude of the case worker, as he reaches diagnosis, may well be, "This looks like a case of inadequate mentality, but we shall get more light as the treatment goes on."

The critical importance of ultimately determining primary causation being in mind, the investigator proceeds to work up the case in the following order keeping extended and careful notes from step to step:

I. Symptoms

The point of departure is a careful survey of the present situation. Wherein is the pupil found to be a remedial case?

His chronological age and number of years in school are noted. His backwardness in various school subjects is investigated and accurately set down. The instances of misconduct are ascertained and verified. The statements of various teachers and other persons who have first-hand knowledge of the case are sought and recorded. In brief, all possible information touching present conditions is hunted down. Two major precautions are to be observed.

1. All statements whatsoever must be verified, either as first-hand knowledge on the part of the witness or else followed back to the point of corroboration. Too often the whole foundation upon which a case has been growing to remedial dimensions is found to be based upon little more than gossip. This is of course especially true of conduct cases, and, above all, of alleged sex perversions.
2. All statements should be rejected which enter into the historical background or which are in the nature of opinions touching matters of fact.

Teachers will sometimes become voluble about the past history of the pupil. Their statements are often useful in later connections, but to note them here is to confuse the record and to prejudice later findings. Further, the events of the past are to be evaluated as significant or immaterial and the former run down and verified in the proper place and in the proper connections, namely in the case history.

Similarly, such statements as "Is a poor reader," "Does not

know his tables," "Does not concentrate," will be offered. All such assertions are valueless because they are matters of opinion concerning conditions which are matters of ascertainable fact. The investigator will perhaps note them as clues to be followed up in the next step, but he will not record them as symptoms.

When the story at this initial stage is felt to be all in, it is written up and the meat of the matter is extracted in summary. In the best administrative technique, the personnel officer will probably have gathered at least the outlines of this part of the case history before registering and assigning for remedial investigation and treatment.

II. Examination

The investigator now turns to the various tests and measurements which are capable of giving more precise information. Every case must be treated in the light of its own requirements, the best technique, here as elsewhere, will depend upon the ingenuity and scholarship and diligence of the case worker. Certain fundamental routine tests may be enumerated:

A. Psycho-physical

1. Vision

2. Hearing

The routine medical inspection data will usually clear up the issues on these fundamental sensory qualities. The investigator should, however, keep an open mind and be prepared to return to the question of vision especially, if the subsequent progress of investigation gives reason to suspect that there may be obscure difficulties present.

3. Co-ordination (neuro-muscular)

There are no good co-ordination tests available for the use of the pedagogical investigator. The issue can, however, be canvassed by observing the pupil's reactions in physical education and in manual training and especially in handwriting. The case worker should invariably ascertain if there has been a history of forced transfer from left-handedness to right-handedness.

4. Speech

Look for evidence of stammering and unusual hesita-

tion and ascertain if there is a history of stammering. Note, also, in this connection a possible history of forced transfer of handedness. It should be borne in mind, however, that the relation of such transfers to stammering is far from being the only cause of the latter, if indeed there is any established relation at all.

B. Health

1. Height-weight ratio (see Baldwin-Wood tables)
2. Nutrition

The dietary should be canvassed for calory and vitamin intake. The home-economics department can often be drafted into this service.

3. Teeth
4. General physical condition

Medical inspection data

If the investigator has still reason to doubt general health condition, the parent should be persuaded to provide for a more thorough examination.

C. Educational

1. Reading

The investigation of reading ability goes to the root of the matter more critically than any other part of the examination, and happily we have reliable test material available. In general, there are three fundamental issues to be raised:

- a) Can the pupil read at all? That is, does he react to the meaning of the printed page?

Cases are occasionally found in which pupils progress incredibly, in schools which are addicted to the performance stereotype, without any actual reading ability as such at all. A Burgess test is perhaps the readiest means of detecting these people. A good substitute and supplement is the following device: A series of cards is typed containing simple test directions such as "Go to the teacher's desk and bring me the red book." Several of these cards in succession are handed to the pupil without comment and his reactions are noted.

b) Has the pupil formed the primary adaptation?

A very considerable number of pupils find their way into the high school and even into the college without the reading adaptation. They can get the meaning from the printed page but they do so laboriously by a process of deciphering. In effect, they are usually slow students, and when they reach the subjects which require assimilation by extensive reading—all subjects in the science type except mathematics and grammar—they become problem cases. They do not study effectively subjects which require extensive reading because they do not reflect upon the meaning as they read.

The decipherer can usually be detected by direct observation of the eye movements, and by noting the reading behavior as the pupil turns the pages in silent reading.

c) Rate of reading

The two primary issues in reading being cleared up, it is altogether probable that most pupils read at a rate which is a function of their basal organic reaction. If they read slowly, they do so because they are mentally slow-moving people. There is nothing to worry about in that case; other things being equal, a slow section is the treatment indicated. Nevertheless, pupils are occasionally found who read slowly through sheer indolence or defect in volitional maturing. Training is required (see chap. xv, p. 296).

If the pupil is found to be extremely defective in reading ability, but still not a plain non-reader, the problem is to find out why. There may be a variety of reasons. Skilful probing of the case will often disclose the difficulty. Children are prone to take on all sorts of queer perversions in their learning. The case worker will do well to have at hand Gray's *Remedial Cases*.³

³ W. S. Gray, *Remedial Cases in Reading: Their Diagnosis and Treatment*. Chicago: University of Chicago Press, 1922.

In the case of reading, as in the cases of all other examination results, the possibility of remote and obscure causes at work must be kept in mind. It is not to be expected that the regular case worker will be qualified to look for such remoter causes any more than he is qualified to ferret out obscure physical maladies, but he should be sufficiently familiar with the progress of scientific work to know where to send the pupil for special examination if need be.

2. Arithmetic and number

a) General survey

A test of the character of Woody-McCall *Mixed Fundamentals*. If the survey of symptoms discloses no special defects in subjects of the practical-arts and physical-science types, normal response on this general test is perhaps sufficient. On the other hand, thorough case work leaves no stone unturned and, especially if the pupil is poor in the subjects above named, further investigation may probably be necessary.

b) Primary number adaptations

Pupils are not infrequently encountered at advanced stages in their school careers who have not made the primary adaptations. They may be able to count sufficiently well to "make their grades" in arithmetic but, when called upon to use arithmetical processes in their study in the middle and later secondary period, no assimilation takes place. These are the folk who are apt to present to the teacher an absurd result, in physics let us say, wholly unconscious of its absurdity. Simple diagnostic tests devised for the purpose, out of current work, will usually serve to disclose the situation.

c) Command of the primary number combinations and tables

Effective study in subjects which employ arithmetical processes requires automatic command in this field. It is not enough that the pupil know his

tables and combinations; he must know them so well that he can use them without focal consciousness of the process of recall.

Flash-card testing with observation of the character of the responses will readily settle this issue.

d) Recognition of mathematical situations

A very common pupil difficulty found in mathematics and in subjects which require the use of mathematics in their assimilative material is illustrated by the absurd question, "Do you multiply or divide?" Such pupils are normally the product of arithmetical teaching which has failed to set up a series of units in which recognition of the mathematical situation is identified as an essential element in the true learning product. Instead of consistently working in the application of processes to concrete problems, they have had much practice with processes and the essential outcome in useful learning has been left to chance.

In canvassing the symptoms this defect may appear. If not, one of the standard arithmetical reasoning tests, notably Reavis-Breslich, with scrutiny of test responses rather than merely noting the score, will serve. Still further, typical problems may be set for the purpose of discovering whether or not this particular defect is present.

3. The handwriting adaptation and handwriting rate

Slow learners are sometimes found in whose cases the root of the difficulty appears to be the abnormally slow rate at which they prepare written papers. The defect may be due simply to abnormally slow handwriting and in that event the case is corrective rather than remedial. Or it may be due to the fact that the pupil has never passed out of the drawing stage; he has simply learned to draw rapidly.

4. The primary written-expression adaptation

"Cannot write an acceptable paper." A pupil who exhibits the symptom thus noted is likely to experience an

abbreviated school career, both because written papers are necessarily required in various courses and because he lacks an essential study tool. The defect of course may be simply a corrective problem in English writing. It may, on the other hand, amount to lack of the primary adaptation, that is, the pupil does not sense that what he writes is intended to mean anything.

5. Apperceptive mass

As we have repeatedly urged in preceding chapters, a rich ideational background is essential to learning, especially in the science and appreciation types. We have reference here, not to the specific background essential to success in a given course, what we commonly term "preparation," but to the general experiential background. A great many baffling problem cases at perhaps about fifth-grade level and beyond are without much doubt mainly instances of intellectual starvation. The pupil fails to assimilate new material because it is hopelessly strange to him.

In investigating this aspect of the problem, one or more of the vocabulary tests is serviceable. But the vocabulary test is not sufficient. It should be furthered by a prolonged interview with the pupil, in which the examiner seeks to learn the various subjects upon which the pupil can talk and in which he exhibits interest. Especially should the pupil be encouraged to talk about what he has read. The character of the reading, if any has been done, is likely to be illuminating, and we may find that the pupil has actually never read anything at all beyond the rather meager classroom requirements of the school which he has been attending.

6. An essentially important part of process of training is the development of the capacity of sustained application in study. Hence the examiner secures a series of profiles which are typical of the pupil's capacity.
7. Similarly, the lesson-learning attitude is investigated (see chap. iv for procedure).

D. Mentality

1. A general intelligence test of the comprehensive language type
2. A non-language mental test

The mental age and I.Q. should be noted on both types of test and compared, and the test results compared with the general revelations of the examination for apperceptive mass. A low I.Q. is of course presumptive evidence of low mentality or even defective mentality, but the disclosures should be carefully weighed in the light of other evidence collected in the examination, and final decision withheld until after the school, family, and social histories have been explored. If the social history, for instance, shows that the pupil's out-of-school life exhibits usual capacity, the weight of evidence from a low I.Q. is lessened. If, on the other hand, the family history shows a neurotic or criminalistic record among the ascendants and problem-case school histories among the siblings, we are inclined to attach more importance to the low intelligence rating in our problem.

Definite classification of a pupil as subnormal is, however, too serious a matter to be rested on the findings of a single investigator in the routine of ordinary school case work. The case worker ought to be familiar with the nature of subnormality, with its differential characteristics and symptoms and perhaps with the clinical procedure by which it is identified. Beyond that, he ought to have corroboration of his own findings in those of a specially trained worker.

The examination results being thus all in, they are digested and their apparent net import is noted.

CAUTION.—Case work of the sort which we are here studying is pedagogical case work. It is neither psychological, psychiatric, social, nor medical. In the majority of school cases the root of the trouble is purely educational and correctable by pedagogical methods. The symptomatology however may easily make the case look as if some organic or emotional disorder were present.

The child-guidance clinics often, perhaps usually, act on that theory, accepting the school as beyond any question as to its own functioning. Nevertheless, there may be present disorders which are purely mental in character, apart from mental subnormality. For example, there are occasionally present sensory-motor or perceptual inco-ordinations which interfere with learning in the fundamental school arts. See for instance Dearborn's discussion of special abilities and disabilities in his *Intelligence Tests* (1928). There may be present psychopathic disorders which in their origin are unrelated to school work. A case may be essentially social or medical in its nature and not pedagogical. The proficient case worker ought to be able to note the symptoms which probably betray non-educational origins and to be competent to call to his assistance the appropriate specialists.

III. Health history

While the health history, as distinguished from the physical examination, commonly furnishes little direct enlightenment to the pedagogical case worker, it sometimes gives the observant investigator his clue touching the matter of further medical examination at the hands of a qualified practitioner. It more often gives us important circumstantial evidence particularly on the following points.

A case of volitional retardation—spoiled child—frequently goes back to a history of persistent bad health in the preschool years. The mother in her concern for her child gets into the habit of shielding him, not only from all which might contribute to his ill health, but from any sort of exposure to the normal rough contacts of childhood. The habit persists and even at high school level the parental attitude has become a sort of protective obsession. Now, the essence of case work is accounting for maladjustment. If our retarded child, as a matter of fact, began to be spoiled, or is now being spoiled, in school, the remedial procedure is quite different from that which is appropriate where the root of the matter is in the home. If the home spoiling is a carry-over from a sickly babyhood, remedial pressure upon the home is different from that which is appropriate when the

spoiling is traceable merely to neglect or parental self-indulgence.

A case which seems to be experiential in type sometimes goes back to a malady in early school years which kept the child out of school for a more or less prolonged period, and which perhaps handicapped him for some time after his return. Now it makes all the difference in the world whether we can say, "This whole tangle of maladjustments originated in that attack of measles in the fourth grade and its *sequelae*"; or "The pupil was obliged to repeat IV A and V B and has not made a genuine mastery promotion since." In the one instance, we account for the origin of the difficulty; in the other, we are likely to adopt the vague inference, "sluggish learning power." In spite of the fact that the pupil is perfectly well and physically vigorous today, his earlier health history gives us a means of more adequately understanding him and the factors which have been at work in his development.

IV. School history

The value of the school history in tracing out the problem case is too obvious to require comment, and the ramifications which may be found are beyond enumeration. Adequate case work will again depend more upon the ingenuity of the investigator than upon any set body of prescriptions whatsoever. Nevertheless, it is convenient to keep in mind the routine of items which experience shows should always be checked up.

A. Promotions

Has the pupil's progress through school been regular or has he experienced retardation or acceleration at certain points and to what extent? Either retardation or acceleration may have an important bearing on the maladjustment.

- B. Character of learning exhibited or, in common parlance, "kind of work done."
- C. Has he moved about from school to school and especially from city to city or from country to city?
- D. Quality of the schools attended and especially teaching methods and administrative methods used. Inappropriate

method, especially in reading, and the passing grade in administration often explain much.

- E. Relations with individual teachers. Many problem cases start life in perverse emotional attitudes generated through bygone and forgotten unwise management on the part of some teacher. Quite as often, perhaps, maladjustment owes its origin to the iniquitous ways of the classroom demagogue.

During the process of following back the school history, we do, in the majority of cases, identify the point at which the trouble began. We may still have to go far before we can explain satisfactorily just why the difficulty originated when it did, but, knowing its beginnings, we at least have our point of departure.

V. Family history and home conditions

Even more important than the school history in explaining a problem pupil is the family history and the present conditions in the home life.

A. Ancestry, parents, and siblings

The chief contribution to be made here is verification of the mentality-test findings. If the examination discloses a suspiciously low I.Q. on both language and non-language tests, and we find a family history in either of the parental lines, or near collaterals, in which appear ne'er-do-wells, neurotics, criminalistic tendencies, prostitution, or other manifestations of the kingdom of evils, especially if we find one or more of the brothers and sisters who exhibit traits akin to what we find in our problem case, we may not be justified ourselves in a finding of true mental deficiency, but shall certainly be unwarranted in closing the case without reference to a competent specialist.

Conversely, if we find a notably normal family background, we gain confidence that our particular problem has its causation outside genetic influences.

B. Economic status and history

The possible influence of inferior economic status upon the child's well-being, either through partial failure of the elementary provisions of food, clothing, and shelter, or

through the generation of inhibiting emotional attitudes, is manifest. Less obvious is the influence of the recent economic history of the family. America is full of instances in which less than a generation has sufficed to elevate families from long habituation to the usages of the old-world peasantry to affluence. In possession of riches, they are guided neither by the traditions of generations of wealth nor by the sense of personal dignity which is apt to be the inheritance of families long accustomed to American standards. Such families frequently engender in their children perverse attitudes toward school which are apt to be most obscure and difficult to reach. Typical of such is the occasional disclosure, in problem cases late in the secondary period, that the child has not only himself been bribed all his school life but that he has systematically been taught that his success at school depends upon his ability to bribe his teachers in some fashion.

C. Cultural resources of the home

Most remedial cases exhibit meager apperceptive mass. The statement will stand for many pupils who do not become problem cases, but the latter, either through native curiosity, or fortunate circumstances, or sheer brightness and determination, measurably repair the defect. The pupil who comes from a cultivated home and an atmosphere of books may still become a remedial case, and it is probably seldom true that the child of the untutored traces his difficulties solely to the lack of cultural resources at home. Nevertheless, lack of books at home, lack of informative conversation, lack of interest in learning and what learning means, is always a serious handicap, and, other things being equal, may be the critical point in the treatment. In cases which are before me as I write, more than one shows that marked improvement took place as soon as the pupil was induced to become interested in reading good books.

D. Relations within the home

Entirely apart from sheer lack of control at home, many problem cases at school originate in emotional attitudes set up by various unfortunate relations between the child and

his parents, between him and one or more brothers or sisters, between the parents themselves, between one of the parents and some member of the household who is not a member of the family. Such relationships are not easily discovered, but sooner or later the careful and patient investigator gets a clue, follows it up, and uncovers the situation. The maladjustment thus found may turn out to be the primary causation and in that case correction of the difficulty will rapidly clear up the whole case. It is more likely to be contributory in its nature, and in that case removal means earlier results from the remedial treatment and, what is more important, permanent results.

E. Attitude of parents toward society

The maladies of one generation constantly propagate themselves into the next. School problems when followed back into the home are sometimes found to consist in perverse emotional and volitional attitudes generated by the discontent and rebellion of the parents. When a boy hears little about the table at home but diatribes on the injustice of the world and of the social order, it is not surprising if his whole attitude toward the school is surly and lawless. As far as the child's own problem is concerned, it makes little difference whether the parent is simply a grouchy ne'er-do-well or an intelligent critic of maladies in the social order. The child in either case may take on a perverse attitude which seems to him normal and right.

F. Adjustment of parents to American standards

A situation familiar to the case worker is that of the child who represents the first generation on this soil. In such families, the children frequently outstrip the parents in adjustment to American conditions and of course such adjustment is apt to be of an undesirable sort. The parents, with the best will in the world, are unable to manage and guide the children because they do not know how. Needless to say, the statement is far from true of all immigrant families, and, even when it is true, many of the children make normal adjustments and do not become problems either in school or out.

G. Control

If there were only one type of parental slackness or unfitness in the rearing of children, it would be sufficient to note the item and pass on. Unhappily there are various types of parental incompetency, and the appropriate corrective measures vary from type to type.

1. The most difficult of all is, of course, the well-to-do family which is entirely able to control its children but will not. We must further distinguish here between the family which systematically spoils one or more of its children and that which simply renounces parental responsibility—lets the children grow up as they will—or commits them to the oversight and control of unsuitable servants.

Spoiling often has its origin, not in parental self-indulgence, but in a mistaken attitude in the parent—usually the mother. More often than not perhaps the attitude, as we have seen, goes back to a sickly childhood or to a much-desired and only child. The resolute, well-informed, and tactful personnel worker can often discharge such an attitude by making the parent conscious of its origin and of the mischief it is causing.

Neglect and sheer parental self-indulgence, of course, indirectly results in spoiling, but it achieves much more beside. Perhaps the father is more often guilty here than the mother. In general, two methods of approach are applicable. In many if not most cases, determined and vigorous and plain-spoken representations to the parent do, as a matter of fact, achieve the purpose. Nevertheless, parental neglect is rather apt to be a matter of neighborhood custom and public opinion. Accordingly, the school achieves its purpose by creating a public opinion favorable to strong home government. Nearly every community has a number of agencies through which such organization of public opinion can be achieved by a strong and capable principal.

2. Next in order of difficulty, perhaps, is the vicious home or that of sheer futile congenital incompetency. When the facts have been completely gathered, court action re-

moving the child from the custody of the parents is usually possible, especially if the school summons to its aid one or more of the local social agencies which specialize in dealing with such cases.

3. Finally, the dependent or semi-dependent home, in which children get beyond control, not by reason of parental neglect or incompetency, but because the parent, usually the mother, must be the bread-winner as well as the homemaker. In some of the more enlightened states, mother's-aid acts furnish a means of relief. In any properly organized community, the personnel administration of the school can focus the attention of the relief agencies on the case, and, what is perhaps more important, furnish them with effective support, in the way of both facts and influence. If the community is not properly organized, it is the business of the principal as a good citizen and trained man to see that it gets organized.

VI. Social history and contacts

We have reference here to that part of the pupil's background which is outside the school and the home. What contacts has the pupil now and what has he had in the past?

- A. What has been his church and Sunday-school history? Is the pupil a member or has he been a member of the Boy Scouts or has she belonged to the Girl Scouts? With what other similar agencies is he or has he been in contact? This part of the record is valuable, not only for the sake of inventorying the influences which have been at work, but also as a list of the agencies which may be got to work on the pupil.
- B. Does the pupil play normally with boys and girls of his own age, and has he always done so?
- C. Has there been a summer-camp experience? If so, what was its character? What was the record in camp? Why was the pupil sent to camp? The answer to the last question often throws important light on the home relations.
- D. What, if any, are his gang affiliations, wholesome or otherwise? If he is now a member of a vicious gang or one of unwholesome tendencies, when did the relation have its begin-

ning? Did the beginning of gang life synchronize with any noteworthy episode in his school or family history?

- E. Is there an abnormal sex history? This question should be approached with great deliberation, not because it is unimportant and not altogether because of the peculiar respect due to so intimate an aspect of the pupil's life, but rather as a safeguard on the part of the investigator against credulity and exaggerated concern.
- F. Is there a court record, either actual or implied?
- G. Has the pupil engaged in "bumming" expeditions, and if so what were the circumstances?

VII. Diagnosis

As the case is worked out step by step, the investigator is frequently sure that he has hit upon the explanation of the whole difficulty. It may be so, but the thorough case worker waits until the evidence is all in and he is ready to think out his diagnosis in the light of the whole story. The practical difference between hasty inference and deliberate conclusion from a well-worked history is apt to be the difference between the temporary adjustment and permanent cure. Ideally, it is always desirable to write up the case, both for the sake of the record itself as an addition to our stock of evidential material and because "writing maketh the exact man." Step by step the diagnosis is worked out from the facts found in the investigation and each step is fortified in summary by a reasoned analysis and marshaling of the facts. The structural framework of diagnosis is a theory of causation, that is to say, a theory of the relative effects of the different causal factors which have been at work.

Causation

1. Primary

There is always some point at which any given case began to go wrong from causes which carried in their train the whole tangle of maladjustments which are the pupil's final heritage. We cannot always work back to this primary causation, and it is sometimes extremely difficult to distinguish with confidence between primary and contributory; but, in most cases, it is entirely possible to do so. However

that may be, effective treatment and lasting adjustment depend upon accurate identification of the fundamental seat of the trouble.

2. Secondary, tertiary, etc.

Out of the primary causation grow others which in their turn begin to operate as causes. For example, a child in the seventh grade is found to be a remedial case in which there are both conduct and intellectual elements. The examination shows a variety of experiential inabilities, including marked retardation in reading. The school history shows no great difficulty until the fourth grade. It shows further a bad method of teaching reading, non-mastery promotions in I and II, and two non-promotions in III and IV. Early in IV the pupil begins to be classed as a bad boy, and he has a checkered career from that point on, until in VII he is two years retarded and is impatiently waiting to become sixteen years of age, the end of compulsory schooling. The primary causation is defective reading ability. This, of course, results in study inability as soon as he reaches the levels at which study becomes essential—secondary causation. He gets out of step with his class and out of countenance with the school. He becomes a marked conduct case—truancy, “bumming” expeditions, gang life, and a near-court case. Of course, this all contributes further to his learning inabilities—tertiary causation.

Now we might have found poor vision in this case and, following back the health history, have found reason to believe that the pupil's eyes had always been bad. In that case, we conclude that he failed to learn to read properly, not because of a bad method of teaching and negligent follow-up, but because he could use his eyes only with great difficulty. Thus the primary causation became bad eyesight, leading in truth to a chain of other causes, but still a marked handicap to all school work.

3. Contributory

It frequently happens that the health and family histories particularly reveal features of the child life which operate as handicaps rather than specific causes. These we draw into the picture as contributory causation. In the case cited

above, we might well have found the chain of causation within the school much as described and in addition have found a cheerless and nagging and abusive home life. The contributory causation is never enough to explain the case but it is often enough to handicap successful treatment.

Typical diagnosis

The process of extracting valid diagnosis from a case history may perhaps be clearer if we take a typical case and follow it through. For this purpose we shall use the case of Mildred found in *Three Problem Children*, before cited.

Now this case turns up in a clinic whose methods are predominantly psychiatric. It might well have appeared as a remedial case in a public school. Supposing such to have been true, what could the school's personnel office have made out of the history?

The primary causation here is practically complete inability to read the printed page. The pupil has never actually passed beyond the first grade, although she belongs normally in the sixth. So far as we can read the scanty school history available, the original school practically seems never to have taken the trouble to teach the child to read, and other schools either could not or would not study the case and apply remedial treatment. The psychological examination shows undoubtedly normal mentality and the physical examination shows normal physical development and good health, save for the maladies noted below.

Non-promotion resulting from the primary cause has brought about a marked emotional disorder contributed to by the home relations, particularly those subsisting between Mildred and her younger sister. She becomes sullen and moody in the extreme, with occasional outbursts of temper, and of course hostile to all the school means in her life. Thus a secondary causation growing directly out of the primary which operates to further complicate a disordered personality, but which likewise, from the pedagogical point of view, is enough to inhibit any chance possibility of the child's correcting of her own initiative the original difficulty.

Still a third link in the causal chain is the almost complete failure to develop any normal ideational background such as learning in the school requires. Even though she might now

learn to read, the whole educational content proper to the elementary period must be built up.

There are two and possibly three elements in the health and family history which are contributory to the main lines of causation.

1. Mildred has been afflicted with enuresis and, since she has slept with the same younger sister who has ridiculed her school failures and apparent stupidity, the shame which she experiences clearly adds to the emotional disorder which is the outstanding symptom in the clinic.
2. She is further afflicted with congenital syphilis, and has been undergoing painful treatment which she greatly dreads and resents. The medical examination does not reveal serious effects of the malady on her general health as yet.
3. The home is in general squalid. The father is a drunken loafer, a syphilitic himself and presumably responsible for a similar condition in the mother and in this child. Mildred is, however, fond of the father, and it is perhaps doubtful that the generally unfavorable condition in the home contributes much to the problem.

The contributory aspects of this case may or may not be in themselves sufficient to have created a formidable problem, apart from the primary causation found in the school and its *sequelae*. It is clear that they could not have created this particular problem. It is plain, however, that the contributory causation must if possible be removed in the treatment.

VIII. Treatment

- A. Out of the diagnostic findings grows the definite, systematic plan of treatment. In Mildred's case treatment was planned according to the following scheme.
 1. The fundamental attack is made upon the primary causation, that is, a tutor is employed to teach the child to read.
 2. The emotional disorder and its implications in conduct are recognized by endeavoring to convince Mildred that she has friends and by securing the co-operation of teachers to that end. It is not expected that this element in the case will wholly clear up until the primary causa-

tion is removed and the pupil has found her way into something like her normal age-grade standing.

3. Attempts are made to build up a working apperceptive mass by:
 - a) Establishing relations with other girls of her age, which has also important connections with 2.
 - b) Creating an interest in reading as soon as she has progressed far enough to read at all.
4. The contributory causation is met in part at least by ameliorating the conditions at home.
 - a) The sleeping arrangements are rearranged. Enuresis subsequently ceased.

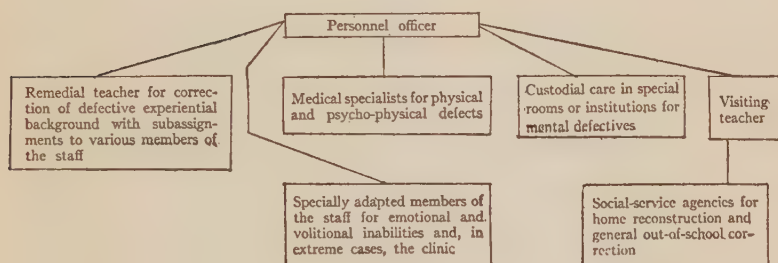


FIG. 15

- b) The child is helped with her dispensary problem.
- c) Attempts are made to improve the general home conditions, but without conspicuous success.

In the end the case is so nearly remedied that the pupil is able to lead a fairly normal and happy life.

Now, as we have seen, we are using this case as illustrative of a rather extreme pedagogical remedial case. There is little in such cases which will not yield to strictly pedagogical treatment, with reasonable psychiatric and medical advice and support.

After systematic remedial work in a school has become well established, a representation of the agencies commonly employed may look something like the chart shown in Figure 15. The route of the typical remedial case is something like the representation in Figure 16.

- B. As the treatment proceeds, a complete record of treatment

is kept by the person assigned to general oversight of the case. If the case is predominantly intellectual in character, the remedial teacher will ordinarily keep the record, collecting data from other members of the staff to whom are assigned special phases. If the case is primarily conduct with out-of-school connections, then the record will naturally be kept by the visiting teacher.

A carefully prepared written record is desirable, first, because such tends to become a valuable control encouraging systematic work; and, second, because every case so treated

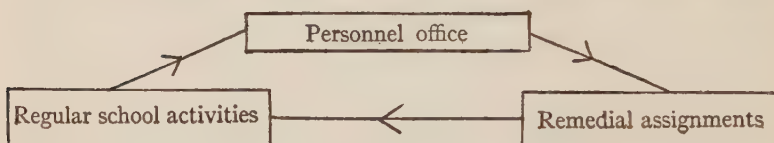


FIG. 16

adds to the stock of knowledge applicable to the interpretation and treatment of subsequent cases. The record contains the following major elements:

1. What is done from day to day or from week to week, method and procedure. In cases which are not assigned to outside specialists, this will of course constitute the largest part of the volume of the record.
2. Progress in clearing up contributory causation.
3. Results of periodical significant tests, corresponding to the examination.
4. The observed unsupervised behavior in so far as it contributes evidential material touching the progress of readjustment.

IX. Follow-up

After the case is believed on the evidence to have been remedied and the pupil has been restored to regular school standing, it is reconsidered from time to time for the sake of noting whether or not any of the old symptoms have returned. If the pupil relapses, he is of course restored to remedial study and treatment. Otherwise, after a reasonable test interval under normal conditions, a follow-up survey is written, included in the case history, and the case is closed.

CHAPTER XXXI

ORGANIZING THE SCHOOL

WE REITERATE the principle that the school exists for the stimulation and guidance of the individual pupil into a state of adjustment to the physical and social and spiritual world in which he must live. We contrast with that conception of the office of the school in this closing chapter, just as we have in nearly every preceding chapter, concrete practices founded upon the implied conception that the function of the school consists in organizing courses, hearing lessons, and recording pupil performance on the content thereof. The whole notion of systematic teaching with its corrective and remedial work ultimately requires a theory and practice of school organization fundamentally unlike that appropriate to the school which is committed to the lesson-learning technique.

When we turn back in retrospect to the small village or country school of other days, and to the small college, we find a situation in which the schoolmaster could oversee the development of all his pupils. The president of the small college frequently felt called upon to exercise a pastoral function over the students committed to his care. Schools were small and all the members of the faculty or teaching staff could know all the students or pupils. The curriculum was simple and extra-curriculum activities were not known under that name. In the control and guidance of their pupils, these old schoolmasters were obliged to depend upon common sense, upon such ripe wisdom as they possessed, and upon their humanitarian inclinations, for they had not a tithe of the instrumentalities for the study of the individual with which we are equipped today. As schools increased in enrolment, organization became necessary and organization took the course which we have repeatedly noted and criticized. Sys-

tem and not the pupil came to occupy the administrative mind and the small school tended to copy its larger contemporary. Schools came to be judged by the system which they employed and not by their adaptation to the requirements of the particular situations in which they were supposed to function.

Now the modern school has to be organized so as to do systematically and on a large scale what could be done and often was done by the old village schoolmaster who was pastorally as well as pedagogically inclined. In the preceding chapters, we have sketched specific administrative needs to meet specific situations. It remains to bring these scattered sketches into a coherent composition.

I. Flexible arrangement of clearly defined courses

As we have seen, any course in the secondary period should stand for a definite development in the pupil's attitude toward the world in which he lives or for a definite special ability or art which he has set out to acquire. Such a course contrasts with one which is primarily a body of knowledge which it is hoped may have some use if the pupil shall come to possess it. Credit for such a course, if the term be used, is credit for a real piece of adjustment and not credit for time spent. As we have further seen, such a conception of the nature of courses at once parts company with the notion of the academic year, of nine calendar months more or less, as the base line for school organization. Flexible arrangement has the following major implications:

1. A given course should be opened to sections which are ready for it at such intervals as may be required but oftener than once a year or once a semester. Such an arrangement is likely to require a few spare rooms, but the larger the school, and consequently the larger the number of sections, the less is the likelihood of this handicap, if such it is.¹
2. Credit for a course not taken or taken only in part, when adequate testing shows the pupil to have acquired the learnings

¹ By actual test a school of 500 pupils covering grades VII-XI and occupying 22 classrooms requires two spare rooms in order to provide for the opening of new sections whenever there are pupils ready for them.

for which the course stands, rather than credit for an amount of time spent equivalent to that ordinarily devoted to the course.

3. Use of the fast-and-slow section and of the skip-section when pupils have shown under actual schoolroom conditions that they are in fact rapid or slow learners.
4. Release of pupils and the expanded individual curriculum

As soon as administrative thinking in terms of ground-to-be-covered and time-to-be-spent is broken down and there is substituted thinking in terms of pupil development, it ceases to seem important that every pupil in school shall meet appointments every day with the group with which he is in general associated, or that he shall study only what the rest of his group studies and then all together shall study something else. Hence, the principles of pupil release and of the voluntary project come to be of major administrative importance in flexible course arrangements. In fact, the principle, if fully understood and faithfully and intelligently applied, will "take up the slack" in almost any school in the secondary period. Rapid learners in spelling in the fourth grade, for instance, are released for reading-room activities. Talented pupils in science at senior-high-school level are released for voluntary project work.

5. Closely related to 4 is the writing of the program of general education up to university level proper. That ordinarily means the addition of courses now commonly found in the first two years of a four-year college to the traditional four-year high school program.
6. Hard and loose sequence requirements

As we have seen, some courses in their nature are severely sequential in character, in some the sequential order is of minor importance, and in others still the sequential order is of no importance at all. It makes all the difference in the world in the flexibility of course arrangements whether a pupil who has completed a particular course is limited to a single course in a given field as his next step or has a choice between several courses.

7. Continuous scheduling

It is probably true that the key to a policy of hard-and-fast semester or year courses is to be found in the exigencies of making up the schedule of pupil class assignments. It is administratively exceedingly convenient to make the schedule for a year, with a few minor changes at the end of the first semester, especially if all such staff work has to be done by an overworked principal. Thus the whole educative process in the school becomes adjusted to the Procrustean bed of the schedule of courses. Rather should the large school be equipped with a staff officer whose chief business it is to be in charge of the schedule and to rearrange the same from time to time, with minimum interruption of the routine of class appointments and minimum loss of time to pupils who are ready for new course assignments. The weekly personnel reports from the several teachers should keep such an officer well informed several weeks in advance of the probable time at which new sections will be needed. Such continuous scheduling becomes more understandable and more feasible when it is viewed in the light of 2-6 above.

8. The postponement of departmentalization

Throughout the period of general education, the teacher's knowledge of the pupil is of primary importance, and his knowledge of subject matter taught, not of minor but of secondary importance. The properly equipped, well-educated teacher in the elementary school should have command of the whole curriculum content sufficient for the needs of the children who are met. As the pupils pass on into the high-school region, their requirements become more exacting and academic specialization on the part of the teacher more necessary. Nevertheless, it is well to bear in mind that, human nature being what it is, the teacher's academic specialization tends to be at the expense of knowledge of the pupil and his educational needs. Now in the direction of flexibility of course arrangements and in the direction of breaking down the graded-school stereotypes, there are great administrative advantages in the non-departmentalized room. The teacher can know her pupils much better at a time when pupil knowledge is of maximum

importance, the numerous correlations in subject matter are more obvious and more easily managed, minimum time is lost by pupils in passing from room to room, the check on mastery of the true learning products is more likely to be complete, and the teacher is more inclined to specialize on pupils than on academic subject matter.

II. Accurate and significant pupil accounting²

Recalling our fundamental conception of the school as an institution in which the development and adjustment of the pupil through study in sundry courses and through other experience takes place, we become much less concerned with a record which shows the character of his performance than with one which records evidence of his development. True, the consistent story of the character of his performance may tell us much of what sort of a person he is, but that is another story. Whenever we have occasion to know, the tray of weekly reports tells us in plain English, and it tells us of the standard of performance which he has attained rather than of his average performance. We shall need the following records:

A. The educational register

1. Courses completed

We are not interested in recording incompletes and failures. In fact, there are no failures; a pupil may appear as a chronic remedial case and ultimately be transferred to custodial care or discharged as an evident non-learner or menace to the school. Such a record at least purports to be an accurate description of an educational situation. A record of "failure" is indeterminate and devoid of educational meaning. A pupil once enrolled in a given course is not finally reported until he has completed the course, albeit the record may show further that he is for the time a registered remedial case.

In the same category with classroom courses are the elements of attitude toward conduct. No entry at all means retardation, that is, that the pupil has not taken on the characteristics of normal conduct at his age. The

² See also chap. xxix.

same symbol used for indicating the completion of a course, if entered opposite the name of a conduct attitude indicates normal development with respect to that attitude.

2. Descriptive marks

The marks used to indicate sustained interest and educational self-dependence are developmental indices and not estimates of performance. They are entered in the appropriate space for the course to which reference is made. For example:

General Science M

means that the pupil is believed to have made the adaptations corresponding to the course.

Biology MN

means that the pupil has completed the course and has exhibited evidence of sustained interest.

Chemistry MNR

means that the pupil has completed the course, has exhibited evidence of sustained interest and of tested volitional and intellectual capacity to control his own time.

3. Cross-references to the supplementary records, especially to the remedial case register.

B. The remedial case register

Already described (see p. 642).

C. The master-card

Since so much of constructive school administration and of effective teaching depends upon information about the pupil, it is necessary, for the purpose of saving time alone, to record as much of such information as is susceptible of symbolic expression, in a form which is easily accessible. For this purpose the master-card is set up.

In appearance, the master-card employed in the Laboratory Schools is 11 by 16¼ inches in dimensions and has entry spaces for 425 items. This list is doubtless longer than is needed for routine administration. A working card should, however, have entry spaces for the following classes of factual material:

1. The main facts of family background, including especially racial stock on both sides; occupation of both parents; number of brothers and sisters living and dead; order of birth among the children; parents living or dead; gross marital relations, as divorced, separated, or normal; step-father or stepmother; foster home.
2. School history, including especially age and grade placement on entering the present school and schools previously attended. The educational register, the case folder, and the master-card itself of course exhibit school history in the present school.
3. Standardized test scores

Whenever a standardized test is given in the school, it should be understood that the score will be transmitted for entry on the master-card and the test papers included in the case folder.

4. Health history

The common diseases of childhood and such other portions of the health history as are likely to prove significant. A list of important items is printed and arranged for check-marking.

5. Physical-examination data

The important routine facts are: height, weight, and height-weight index; vision and hearing; dental development as normal, retarded, or precocious; condition of teeth; sexual maturity (girls); pubescence, as pre-pubescent, first, second, or third stage of pubescence in boys.

The master-card data should of course be checked over annually for corrections and extensions. Some items are in their nature such as need to be entered but once; for instance, date of birth. Some may need correction or extension; for instance, sundry items in the family history. Some must be entered anew once a year; for instance, physical and educational data.

D. The case folder

The veritable mine of evidential material touching the growth and development of the pupil is the folder in which is deposited all significant material which is likely to be useful

in accurately appraising his educational progress. Its use is limited chiefly by the space requirements, for it is apt to prove bulky. Among the types of material which should be found in the case folder are the following:

1. Test papers
2. A series of samples of English writing gathered periodical-ly, at least once a year
3. Noteworthy productions, especially at senior-high-school and junior-college level, which are used as evidences of ap-proaching self-dependence
4. Records of significant behavior episodes contributed by the teachers from time to time
5. Sustained-application profiles

Parallel with the case folder and in reality constituting a part thereof is the personnel officer's tray of teacher's periodical report cards.

E. Classroom and departmental records and folders

There are included here such material as pupil-reading rec-ords; papers submitted, from which the best sample finally goes to the general case folder; series of sustained-applica-tion profiles; unit test papers and distributions.

III. Organization of the teaching staff for pupil study

There are two objectives in pupil study: (1) perfecting that understanding of the pupil which is essential to teaching, and (2) checking up the actual growth of pupils by noting their unsuper-vised behavior.

The first, of course, yields its chief results in the application of corrective and remedial teaching, in planning the pupil's program, in opening up special opportunity for special talent. It is the sec-ond with which we are chiefly concerned at this point.

No matter how acute and well calculated our testing, no mat-ter how faithful and diligent reteaching and follow-up may be, we are often disappointed in the educational result. We have re-peatedly seen that the ultimate testing is in terms of the pupil's unsupervised behavior and in terms of such evidence as we may be able to collect touching his self-dependence, his inclination to do right because it is right and to utilize the products of his educa-tion in the conduct of life and the pursuit of his satisfactions.

Such final and fundamental testing requires the organization of the teaching staff for pupil observation and study.

In the course of the chapters which have preceded, we have noted all the elements of such organization each in its proper place and attached to its own specific function. It is perhaps useful to see the elements brought together, and Figure 17 will show the organization schematically.

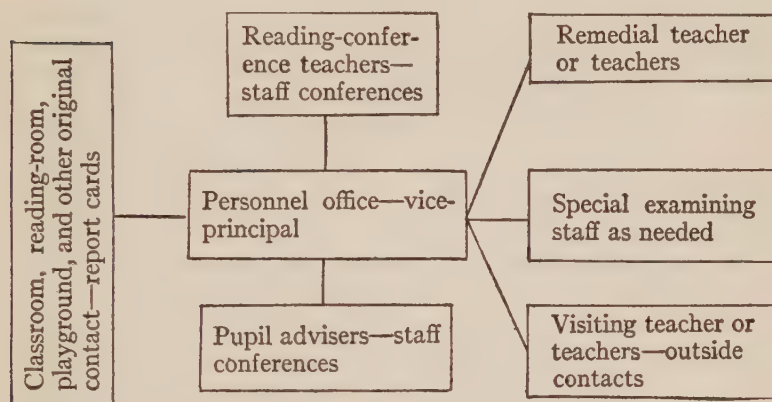


FIG. 17

GRADUALLY OR AT ONCE?

As he has turned these pages, a persistent question has doubtless presented itself to the experienced teacher and executive: Can any school be thus made over in its whole theory and practice of teaching at once or even in a brief period? The wise answer is clearly, No.

Pedagogical history is full of the wreckage of method, in itself sound and good, picked up and put into practice in an apish sort of fashion by enthusiasts eager to be in pedagogical style. The teaching body which is willing to undertake the task of putting its theory and practice upon a basis of systematic procedure, checked up step by step by well-considered evidence of pupil development, must expect to experience a relatively slow process of readjustment. Insight comes slowly. I do not say that the

reader must forthwith proceed to apply for leave of absence and resort to a school of education for further training. That would doubtless help greatly but only in case the student were willing to undergo the process of self-imposed reflection and severe intellectual discipline which would be required if he were to remain in residence in his own school and work out the problem by himself. Furthermore, the student of systematic method must expect that his task will never end. Once given a method of pedagogical thinking, and that is all I hope to have accomplished in this volume, the practicing teacher will find that the more he learns about his art the more there is to learn. There is nothing here which can be mastered once for all and then put in practice forever afterward, with assurance of a new and better kind of educational result.

No matter how clearly all seem to catch the essential message of the book and no matter how promising the early results may be, the school itself as a whole must grow into it little by little. Some schools, like some pupils, will grow rapidly and others slowly; but, slow or fast, growth must be the end in view and not some wonderful transformation. There are some features of the systematic procedure which we have been studying to which any school is readily adaptable, and others that must wait until the school has grown up to them. I think it may prove serviceable to my fellow-practitioners if I suggest the order in which the different features can probably best be undertaken. In so doing, I do not mean to imply that a fixed order by years is essential, that the first of the list be adopted the first year, the next the second, and so on seriatim to the end. It may be that several features will be in full working order by the end of the first year and maybe not.

Several features can be applied to the ordinary lesson-learning technique:

1. Control technique in both aspects, and in all its implications, is applicable, serviceable, and essential in any form of teaching whatsoever

2. Development of reading-room
3. Organization of adviser and reading-conference groups
4. Study of the individual pupil, either:
 - a) By the method of simple intelligent observation and enlightened common sense, or (later in experimental cases)
 - b) By the method of systematic case work.
5. Remedial work in a few cases which have been studied for the purpose. Of course, from time immemorial, devoted teachers have done a great deal of this kind of work, guided only by their native teaching spirit and ready human understanding. There have been suggested in the preceding chapters in numerous instances where to look for remedial cases, what the beginnings are likely to be, wherein typical causations consist

When the school is ready to undertake systematic teaching proper, progress from the fundamental and simple to the accessory and difficult features will probably be found somewhat after the following order:

6. Mastery as applied to the true learning products, in unit organization, type by type and department by department
7. Study at school in the place of home study, with the voluntary project in its several types of usefulness and significance
8. Appraisal of progress by accounting for the learning products rather than by performance grades. Note that performance grades are as applicable to 6 and 7 as to the lesson-learning procedure. We have identified and exhibited their fallacy but their fallacy is no greater under mastery teaching than elsewhere
9. Flexible arrangement of courses and final abandonment of pupil administration by grade promotions and credits for time spent
10. Complete staff organization

CAN IT BE AFFORDED?

Throughout this volume, and especially while reading this concluding chapter, the query has probably frequently been raised, Is not this all impossibly expensive? To answer the question, we must remind ourselves of the place of the school in the economic cycle. The school can justify itself economically, no

matter what its cost in money, only in so far as it creates economic values at least equivalent to those which it consumes. It can create such values only in so far as it succeeds in actually bringing its pupil body into adjustment with the world in which the pupils must live as adults. In the long run every pupil must pay the cost of educating another through excess of economic values which he directly creates and which are attributable to the education which he has received, or through the relative savings in the consumption of goods and services which he makes possible, or through the intelligence which he contributes to society in its utilization of the planet as the patrimony of mankind. Such values can accrue only as the pupil masters the content of his education in the form of the permanent attitudes and acquired abilities to which we have so often referred. No matter how excellent the curriculum, it remains a thing of paper until the pupil has mastered the content thereof. No matter how wonderful the building, it remains a mere meeting place until the pupils who congregate therein emerge with an actual education and not merely a collection of certificates of time spent in school. Neither curriculum nor building nor equipment is the core of the process of education, but rather effective teaching. Given the latter in the form of patient, systematic molding of youthful development which guarantees such development by the very nature of the process which it administers, it makes little difference what schools cost in money for they will always then in their product pay the bill and something over.

As far as classroom teaching is concerned, the teacher who is qualified to teach at all is qualified to teach systematically, with due regard to the central issue of pupil study and pupil development. Such qualifications imply adequate education, adequate training, professional devotion and dependability, willingness to work hard, and long hours. Such people can command good incomes but perhaps no more than our best salary schedules now yield. Any others are expensive at any price for the reasons set forth in the preceding paragraph.

Systematic teaching implies an adequate staff of administrative officers, some of them specialists. Much the same reasoning applies here which applies to the qualifications of teachers. A school which is inadequately staffed with a principal and some associates whose duties are chiefly clerical and promotional in type is apt to be a fatally expensive school because it leaves to chance any genuine education of its pupils. For the most part, the latter loiter more or less good-naturedly along a primrose path, and their attainments in the end are the miserable cheat of a mere smattering which is so common and so often deplored.

We can, however, approach the issue more nearly and speak in terms of current cost.

One of the outstanding revelations in the literature of school costs is the waste attributable to retardation. When pupils take two or more years to learn what they should have learned in one year, they accumulate in the schools and the enrolment becomes expanded beyond what it otherwise would be. Such expansion entails additional cost in teachers' salaries, supplies, and maintenance of buildings, and it engenders excessive capital costs for buildings and equipment. It is a fortunate school system in which the excess cost traceable to this item does not exceed 10 per cent. Now, the tendency of the systematic teaching and administrative technique which we have been studying is to reduce retardation and increase acceleration—perhaps to make net retardation a minus quantity. The elimination of net retardation in most cities of ten thousand population and upward would alone save enough in operating and capital costs to pay the cost of adequate administrative staffs.

The same issue can be approached from another angle. The traditional school career is fourteen years above the kindergarten and including the junior college. Nearly all students of the problem agree that this is probably two years too much, at least two years for the results achieved. The waste is commonly attributed, and rightly, to the inflexible character of our graded system. Experimentally, the period has been reduced to thirteen

years for all pupils who originate in the Laboratory Schools and a further reduction of an additional year or its equivalent has been attained for many pupils. If we can reduce the most expensive years of the program of general education by two, or even one, the saving in actual current cost will go far to offset the added costs attributable to a more efficient organization.

There is still a third issue in the problem of retardation, although it is related rather to ultimate economic cost than to current financial cost. Retardation means elimination, that is, the pupil leaves school and gets more or less permanently out of adjustment to his world. The cost accrues in the form of some dependency, a great deal of delinquency, and a general drag upon social betterment.

We have undertaken in America such a program of free and universal education as the world never yet dreamed of. It would not be difficult to show that great benefits have accrued, but educating the masses and ameliorating the conditions under which they live creates as many problems as it solves. There are not wanting manifold evidences that we have failed to realize the stupendous power of the engine we have set in operation. We cannot turn back; we must, for very existence' sake, go forward. But going forward means substituting for the casual methods of the past intensive, systematic procedures in the hands of very highly trained workers, governed and led by still more highly trained executives and boards of control.

INDEX

INDEX

- Abilities: as learnings, 18; and capacity, 19
- Academies, 3
- Adaptability: critically analyzed, 37-38; as generalized objective, 103
- Adaptation, 20; generalized, 32
- Adaptive inertia, 60, 108
- Adjustment: by adaptation, 20; adaptability, 103
- Algebra, units in, 243
- Altruism, 408; arrested development in, 408-9
- Apperception: apperceptive mass, 39, 120, 172; term defended, 172; segmental apperceptive mass, 173; perverted, 174; organization for, 175; apperceptive sequence established by pre-test, 259
- Application: sustained, 110; measuring, 141-45; training, 145-57; class training, 157; in remedial work, 157; as unit in conduct, 419
- Appraisal: of pupil progress, 62; by time spent, 62-70; influence on student code, 67; by rank in class, 70; effect, 71; by program units, 75-76; valid marks, 78
- Appreciation type, 93; 339-432; as sense of value, 339-40; in education, 343; in modern period, 346; courses, 347-49; units, 349; operative technique, 350; patterns in, 352; adaptive mechanism in, 352; guidance, 353; teachers in, 353; inhibitions, 355; assimilative material, 356; effort, 357; testing, 358
- Arithmetic: primary learnings, 9, 240-42; units in, 238
- Arts, music and other, 397
- Assimilation: in learning cycle, 162-63; assimilative material and unit, 185; as step in science type, 281-321; nature of process, 281; and study, 283; testing, 313-21; perverted use of tests, 320
- Attention, 107; group, 112; sustained, 113
- Attitude: as learning, 17; of understanding, 19, 92; of appreciation, 19; intelligent, 92; value attitudes, 93
- Automatic response, in number facts, 568
- Bagley, W. C., cited, 601
- Bailey, D. C., cited, 207, 309
- Beauchamp, W. L., cited, 89
- Biography: as historical material, 210; unit in literature, 380; as material in conduct, 425
- Bjarnason, L., quoted, 128
- Books, selection of, 362
- Carnegie units, 64
- Case folder, 673
- Case register, 642, 672
- Classroom: study in science type, 286; in literature, 384
- Colby, C. C., cited, 218
- College, 3, 5; admission to, 6; courses in expanded curriculum, 619
- Committee on Methods of Preventing Delinquency, 641
- Community life, unit in, 187
- Conduct: unit analysis applied to, 77; right attitude toward, 399-430; and learning capacity, 401; units in, 405; symptoms and attitudes, 422; teaching in, 424; materials, 424; organization of staff, 428; conference groups, 428; problem cases, 429; testing, 430-31; mastery, 432
- Consequences of own acts, 407
- Constructional activity, 178
- Control technique, 105; consequences of poor, 113-15; as index of teacher's capacity, 116; group control measured, 121-33; reliability of, 127; phase scoring, 129-33; measuring sustained application, 141-45; in presentation, 274
- Co-operation, acceptance of, 414
- Corrective cases, 88, 642
- Correlated mathematics, units in, 245

- Courses: length in science type, 197;
additional, 621; college, 621; course
report, 629
- Creative activities, 95; in literature, 392
- Criticism, right acceptance of, 413
- Cultural background, 350
- Cultural evolution, 340-43
- Curiosity, 107
- Curriculum: implications in appraisal,
68; expanded, 619
- Deferred satisfaction, 407
- Degenerate literature and art, 342, 363,
371; mental ill-health in authors,
363; as infantilism, 416
- Diagnosis, 661
- Dictionary, use of, 526
- Diffuse movements, initial, 165
- Direct teaching, 169
- Discipline, in conduct attitude, 399
- Duty, sense of, 419
- Ecology, human, geography as, 215
- Education levels, fallacy of, 77
- Educational awakening, 4
- Elements: unit elements in general sci-
ence, 182; in community life, 189;
in advanced science, 195; in history,
212; in geography, 226-30; in mathe-
matics, 236-38
- English, *A Student's Dictionary of Psy-
chological Terms*, 403
- Environmental level in science type,
180, 191
- Ethical judgment, 401
- Ethics, student code of, 67
- European history, 204
- Examination in problem case, 647
- Executive management, 581
- Explanation, in science type, 292
- Exploration: pre-test of science type,
256-67; utility, 256-62; conduct of,
262; multiple-response test, 264-65
- Expression, written, as study tool, 304.
See also Written expression
- Extra-curriculum, 179
- Fair play, 410
- Follow-up, in problem case, 666
- Foreign language, 485-510: teaching
process in, 484-94; written expres-
sion in, 489; pronunciation and
phonetics, 494; free reading, 496;
testing, 498-501; problem case, 501;
special testing, 501-4; grammar, 506;
literatures, 508
- Fortitude, 421
- Free reading, 359-74: purpose of, 359;
accounting, 360, 366; reading-room,
362; selection of books, 362; guid-
ance in, 364; conference groups, 370;
home and school, 372
- Geography: and history, 199; courses
and units in, 214-30; in the modern
period, 215; as human ecology, 215;
objectives in, 216; facts and assimila-
tion, 216; courses, 218; geographical
controls, 220; regional study, 220;
earth as a planet, 222; industrial
activities, 223
- Geometry, as inductive study, 234
- Get-by perversion, 47-49
- Goal, moving, in written expression, 516
- Government, 586-88
- Grammar: and mathematics, 231;
course and units in, 252-54
- Graphics, as study tool, 302
- Group control, 121; measured, 121;
reliability, 127; phase scoring, 129-
33; use of, 133; building up, 136
- Guide sheet: materials, 304; structure,
305; construction, 306-12; in mathe-
matics, 306; in science, 308; in his-
tory, 309
- Gymnasium, 14
- Handwriting, 10; as study tool, 299
- Hardy, Marjorie, cited, 481
- Heredity, 594
- History: courses and units in, 200-214;
and geography, 199; in education,
201; survey of civilization, 202;
European, 204; United States, 206;
chronology, 208; overlapping, 208;
omissions, 209; historical interest,
210; of problem case, 654
- Home notices, 634
- Individual differences, 591-99
- Infantilism: emergence from, 12, 402,
408; in promises, 415; in obedience,
416

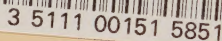
- Initial diffuse movements, 165
- Intelligence: critical definition, 92-93; as product of science-type learnings, 92
- Intelligence tests, 602-6; proper use, 602; prognostic value, 603; bad results in certain cases, 604; in sectioning, 605; rapid promotion, 606-8
- Interest: cultural, 34, 109; defined, 109
- Judd, C. H., cited, 375, 545
- Laboratory: in science type, 287; questioned, 289; direction, 303
- Lange, Dena, 148
- Language-arts, 467-510: learning in, 467; successive adaptations and skills, 470; reading adaptation, 469, 497; inhibitions, 473-75; different objectives, 476-78; normal learning process in language, 479-83; Hardy, Marjorie, cited, 481; learning in foreign language, 484; teaching process in, 484-94. *See also* Foreign language and written expression
- Language-arts type, 96
- Leadership, 420
- Learning capacity, 591-99: adaptive organism, 591-96; organic drives, 592; temperament, 592; subnormality, 592-93; talent, 593; heredity, 594; can and will, 594; personal capacity, 595-600; specific factors, 597
- Learning cycle, 162
- Learning rate, needless spread in, 114
- Learning situation, the, 107-20; defined, 107; other elements in, 117
- Learnings: primary, 8-12; scholarly, 3; true learnings, 17; permanency of, 17, 21, 23; and experience, 27; test for, 31; and performance, 39-40; not in proportion to tasks accomplished, 44; chance learnings, 50; lesson-learning, 52, 57; transfer learning, 57; direct learning, 58; in science, 180; in appreciation, 339; in literature, 375, 378; in conduct, 399; in practical arts, 433, 436; in language, 467; in written expression, 513-15; in pure practice, 541-42; in spelling, 547-49; in number facts, 568
- Lesson-learning, 52; evidence, 53-56; types under, 57; not determinate, 60; educational malady, 61
- Library: in science, 288; in literature, 389
- Literature: teaching in, 359-97; free reading, 359-74; purpose of, 359; accounting, 360; reading-room, 362; selection of books, 362; conference groups, 370; corrective influence in, 371; courses and units in, 375-98; place of, in education, 375; in organized school, 377; units in, 379; credit, 382; teaching procedure, 382, 385; inhibition, 383; classroom in, 384; oral reading in, 386; accounting and testing, 387-89; library in, 389; use of writing in, 390; problem case, 394; in foreign language 397, 508
- Machine, the, 435
- Maddox, C. R., control technique sheet, 142
- Majors, 65
- Manual training, 441-42
- Marks: valid, 78; fallacy in percentile series, 79; in pupil administration, 623
- Master card, 672
- Mastery: defined, 36, 37; critiques, 37-38; formula, 81
- Mathematics: and grammar, 231; courses and units in, 231-51; educational utility, 234; assimilative material in, 248; use of problems, 250; as study tool, 300
- Maturity: theories, 6; in pupil administration, 607
- McCoy, Martha, cited, 394
- McCullough, A. M., study cited, 637
- McDougall, William, cited, 24
- Measuring, limitations in instructional processes, 73-74
- Mechanical detail, reduction of, 118
- Mind, critical definition, 92
- Moral behavior, 400
- Morgan, Catherine, 150
- Motivation, 107-8; spurious, 111
- Music and other arts, 397
- Non-teachable material, 100
- Number facts, 568-74; learnings, 568; teaching technique, 570-74; testing, 573

- Obedience, 415; infantilism in, 416-18
- Objectives of teaching, 16-35
- Operative technique, 159; introduction to, 161
- Order, good, 118
- Organic capacity, 591-96
- Organization: and recitation, 322; as step in science type, 325-28; form of, 325; training, 326; in mathematics and grammar, 327; not a test, 327
- Organizing the school, 581-82, 667-80; flexible arrangement, 668; departmentalization, postponement of, 670; pupil accounting, 671; educational register, 671; marks, 672; case register, 672; master card, 672; case folder, 673; organization for pupil study, 674; gradually or at once, 675; can it be afforded, 677
- Paradigms in foreign language, 574
- Passing grade, 42-44
- Performance: distinguished from learning, 39-49; in pupil appraisal, 65; and new-type tests, 73
- Personal capacity, 595-600
- Personality, 20; adaptations in, 20; intact in abnormal cases, 23; critically defined, 92-91
- Personnel officer, 585
- Personnel organization, 585-86
- Personnel reports, 624-28, 631
- Phase scoring, 129-33
- Physical development, unit analysis applied to, 76
- Playground, 178
- Practical arts, 94, 433-66; learnings in, 433, 436; in general education, 433; evidence for, 435; units in, 437; processes and appliances, 438; elements, 439; manual training, 441-42; vocational courses, 442; home work in, 445; teaching objective, 448; project and exercise, 449; courses in, 455; classroom technique, 455-63; testing, 463; administration, 465
- Practice, forms of, 539-40
- Presentation: as step in science type, 267; in mathematics, 268; in science, 269; nature of, 272-73; requirements of good, 274-77; test, 277; issue in testing, 277; re-presentation, 279; suggestions, 280; sub-presentation, 292
- Pre-test, 82
- Problem case: defined, 88; in science, 312; in literature, 394; in conduct, 429; in foreign language, 501; in spelling, 565; investigation, 636
- Problem pupil—case work, 636-66; social justification, 636; case register, 642; classification, 642-44; major divisions, 644; symptoms, 646; examination, 647-53; history, 654-61; diagnosis, 661; treatment, 664; organization for case work, 665; route of a case in school, 666; follow-up, 666
- Program: units in, 26, 38; implications of appraisal, 69
- Project, in practical arts, 449-54
- Project, voluntary, 90: in science, 184; in history, 205; in literature, 392-94
- Promises, fidelity to, 415
- Propaganda, 16
- Property rights, 410
- Psychology of Social Institutions*, Judd, cited, 375
- Punctuality, 422
- Punctuation, 526
- Pupil accounting, 671
- Pupil administration: basis of, 589-608; individual differences, 591-99; chance and system, 600; critique of studies, 600-602; intelligence tests, 602-6; maturity and adjustment, 607
- Pupil progress, control of, 609-35: unit organization, 609; sequence of courses, 612; science sequence, 612, 618; practical-arts sequence, 612; literature sequence, 613, 617; language sequence, 614; pure practice sequence, 614, 616; mixed sequence, 615; fast and slow sections, 616; skip section, 617; expanded curriculum, 619; voluntary project, 620; additional courses, 621; college courses, 621; pupil record, 623; marks and grades, 623; personnel reports, 624-28, 631; course report, 629; home notices, 634
- Pupil record, 623
- Pure-practice type, 97, 539-75; learning product, 541-42; method in,

- 543; inhibition, 543-46; spelling, 546-68; number facts, 568-74; other uses, 574
- Rapid calculation, 574
- Rapid learner, 89
- Reaction, in learning cycle, 162-63
- Reading: primary learning, 8; free, in apperceptive mass, 176; reading-room, 176; confused with content, 284; as study tool, 294; intensive, 294; extensive, 296; free, in literature, 359-74; conference groups, in literature, 370; oral, in literature, 386; oral, in usage, 525
- Reading-room, 176, 362
- Recitation: and organization, 322; as step in science type, 328; procedure, 328-36; not a test, 330; as training, 330; written, 334
- Reflective Thinking, Introduction to*, cited, 341
- Remedial cases, 88, 641-66
- Repression and suppression, 402
- Reteaching, 82-88; extent of, 86
- Rules and formulas, automatic control, 575
- Sanitation, moral, 427
- School Review*, 53
- Schools: high, 3, 5; elementary, 3, 5; college, 3, 5; primary, 7; in appraisal by time spent, 62
- Science: units in physical and social, 180; units in general, 182; units in organized, 191
- Science type, 92; units in, 180-254; organized for teaching, 255; size of class, 336
- Secondary school, the, 3; defined, 7; limits, 6, 13
- Sections: use of intelligence tests in, 605; fast and slow, 616; skip, 617
- Self-dependence, 14, 35
- Semester-hours, 65
- Sequence of courses, 612-16
- Sex relationships, 411
- Skill, as learning, 17, 18
- Smith, E. T., cited, 206
- Social learnings, primary, 12
- Spelling, 546-68; learning products, 547-49; word lists, 547; relation to vocabulary, 549; pre-test, 550; presentation, 553-56; images, 553; word sense, 554; testing, 556-62; lesson-learner, 561; pupil study, 562; in high school, 564; remedial case, 565-68
- Standard usage in English, 335
- Stereotypes, 4
- Stimulus, in learning cycle, 162
- Study: capacity, 9; defined as objective, 170; process in science type, 283; use of tools of, 285; in classroom, 285; equipment for, 287; laboratory for, in science type questioned, 289; supervised, in science type, 291; tools, 293-304
- Sublimation, 402
- Subnormality, 592-93
- Supervised study: in science type, 291, 293; problem case in, 312
- Supervision, 582-83; teacher-training, 583
- Suppression and repression, 402
- Survey of civilization, 202
- Sustained application, 110; as unit in conduct, 419
- Systematic teaching, 81-103
- Talent, 593
- Teacher-training, supervisory function, 583
- Teaching: in different schools, 6; systematic, 81; and reteaching, 82; types of, 91; importance of, 99; objectives of, 16-35; identified, 167; direct, 169
- Temperament, 592
- Testing: for true learnings, 31, 74; new-type tests, 73; pre-test, 82; in master formula, 82; multiple response, 264-65; presentation, 277; in assimilation in science type, 313; in literature, 387-89; in conduct, 430; in practical arts, 463; in foreign language, 498-501; in written expression, 530, 534; in spelling, 556-62; in number facts, 573
- Thinking, 32-34
- Treatment, in problem case, 664

- Types of teaching, 91; science, 92; appreciation, 93; practical arts, 94; language arts, 96; pure practice, 97
- Typewriting, speed and accuracy in, 574
- Unit: learning unit, 23, defined, 24; program term, 26, 38; objective determination, 26; in general science, 182; in social science, 186; in advanced science, 191; number of in science type, 194; in history, 200-214; historical judgment in, 210; in geography, 220-30; in mathematics and grammar, 231, 234; in arithmetic, 238; in algebra, 243; in correlated mathematics, 245; in geometry, 247; in grammar, 252-54; in literature, 379-80; in conduct, 405; in practical arts, 437; in language, 467; unit organization of program, 609
- United States history, 206; elementary course, 207; advanced, 207
- University, 7
- Usage: standard in English, 335; technique in, 521-29
- Vocational courses, 442-46
- Volkschule*, 14
- Voluntary project, 90; in science, 184; in literature, 392, 620
- Weeks, Ruth Mary, 339
- Williams, Frankwood, quoted, 363
- Written expression, 304, 511-38; exposition, 511; primary adaptation, 512; secondary, 514; developmental phenomena, 515; moving goal, 516; classroom technique, 518; usage, 519-21; technique in usage, 521-29; oral reading, 525; punctuation, 526; dictionary, 526; release, 528; responsibility, 529; testing, 529-32; maturity, 534
- Yearbook, 27th, cited, 602

E.112
952M

[illegible]

PRINTED IN U.S.A.

13M879P 1931

CALL NUMBER

25055 MERRISON/PRACTICE OF TEACH001

ACCESS NO.

DO NOT REMOVE FROM THE BOOK POCKET
A FEE WILL BE CHARGED FOR LOSS OF OR
DAMAGE TO THIS CARD.

MASTER

HETERICK MEMORIAL LIBRARY
ADA, OHIO 45810

Heterick Memorial Library

